

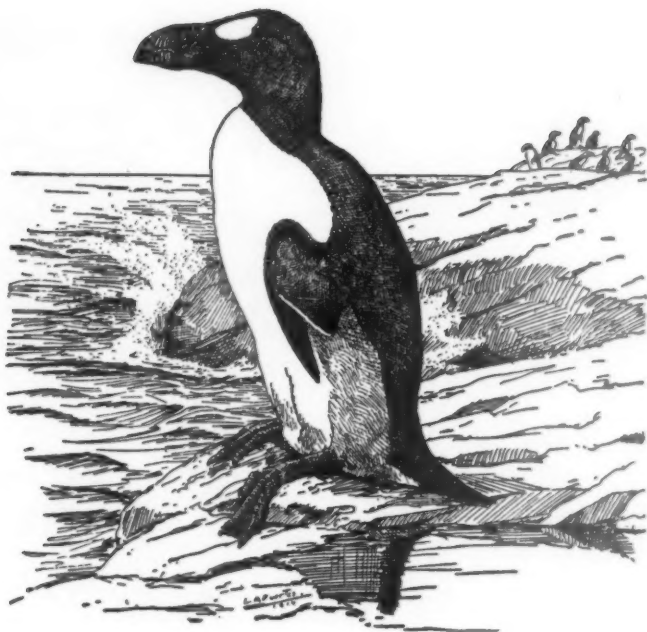
# The Auk

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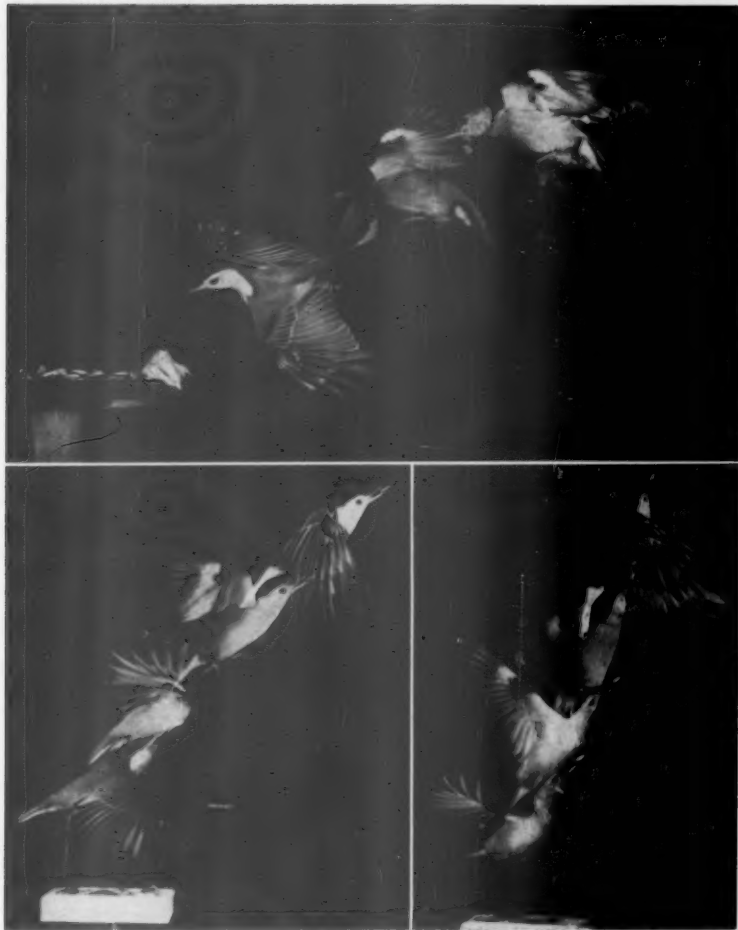
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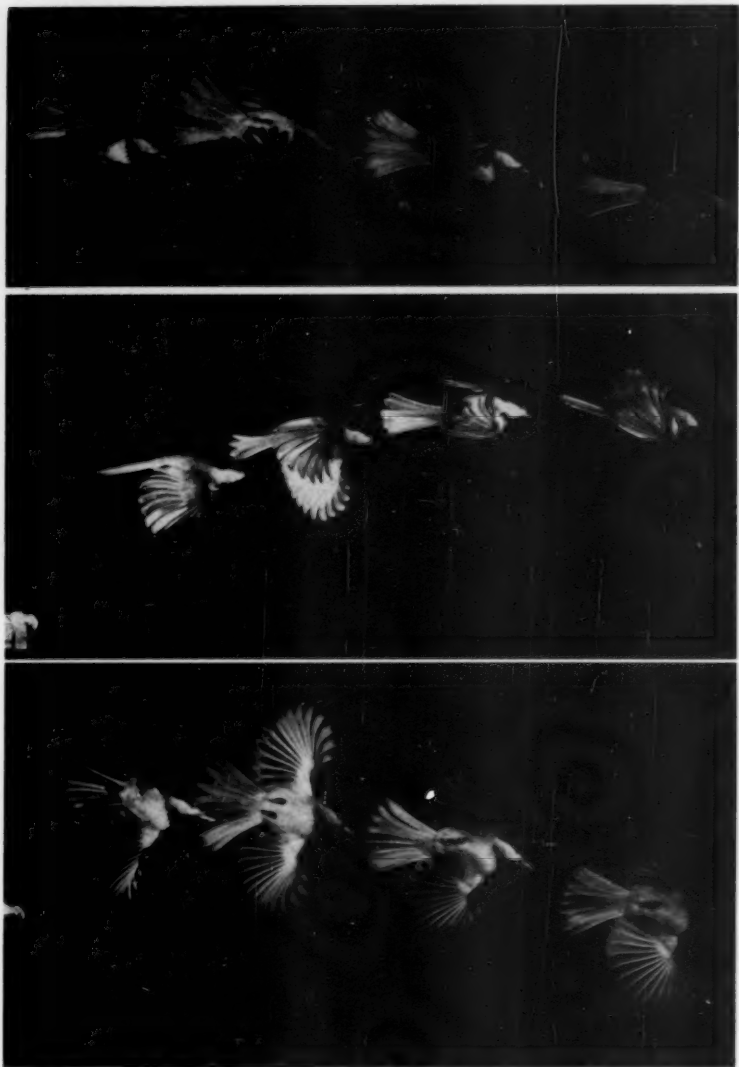
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WHITE-BREASTED NUTHATCHES LANDING AND TAKING OFF. The interval between successive images is 30 milliseconds.



BLACK-CAPPED CHICKADEES IN FLIGHT. The 30-millisecond interval between images almost exactly coincides with the interval between successive wing beats.



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### THE FLIGHT OF THE BLACK-CAPPED CHICKADEE AND THE WHITE-BREASTED NUTHATCH

BY CRAWFORD H. GREENEWALT

FOR several winters, my wife and I have maintained a feeding station for birds at our home near Wilmington, Delaware. This, quite naturally, has led to photographing the birds which come to the feeding tray. The most constant and fearless visitors are the Black-capped Chickadees (*Parus atricapillus*) and the White-breasted Nuthatches (*Sitta carolinensis*), and for these species I have a large enough series of photographs to permit a study of the acceleration, flight speed, and rate of wing beat.

I will not go into specific detail on the equipment used, for that has very little to do with the conclusions. Let me say simply that I used a four- by five-inch view camera so placed that the object : image-size ratio is about four to one. The illumination was by four Heiland Strobosars. Our electronics experts devised for me a piece of equipment which set off these lights successively at controllable time intervals, these intervals being precise to one per cent. I was thus able to get four successive images of the same bird. The usual time interval between images was 30 milliseconds. The apparatus was set off by the bird passing through a photoelectric beam about four inches from the end of a seven- by two-inch feeding tray. The camera was focussed so that the first image was clearly in the field of view, and after some experimentation, I was able to secure conditions which gave me four images on the same film. A black velvet background was used to remove the influence of the ordinary daylight illumination.

The distance through which a bird moved in the interval between flashes was measured directly on the pictures, and the difference between the distances moved between two successive pairs of pictures was used to calculate acceleration. The data obtained by these methods are presented in tables 1 and 2. In a few instances, owing

TABLE 1  
SEQUENCE FLIGHT PICTURES—BLACK-CAPPED CHICKADEE

Speed in meters per second	Number of measurements			Acceleration in meters per second	Number of measurements	
	(1)	(2)	(3)		(4)	(5)
2.3	2	—	—			
2.4	2	—	—	0	—	2
2.5	1	—	—			
2.6	—	—	—	0.1	—	4
2.7	2	—	—			
2.8	8	1	—	0.2	3	4
2.9	1	—	—			
3.0	1	—	—	0.3	—	5
3.1	6	—	—			
3.2	8	2	—	0.4	8	8
3.3	13	2	2			
3.4	2	—	—	0.5	7	1
3.5	7	5	1			
3.6	5	4	1	0.6	8	—
3.7	6	6	1			
3.8	—	—	—	0.7	10	—
3.9	2	8	2			
4.0	3	10	3	0.8	17	—
4.1	1	9	3			
4.2	—	4	1	0.9	5	—
4.3	—	6	2			
4.4	1	1	2	1.0	2	—
4.5	1	2	5			
4.6	—	—	—	1.1	—	—
4.7	1	1	—			
4.8	—	2	—	1.2	3	—
4.9	—	1	1			
Total measurements	73	64	24	Total measurements	63	24
Average speed in meters per second	3.31	3.95	4.10	Average acceleration in meters per second	0.68	0.26
Average speed in miles per hour	7.25	8.65	9.00	Average acceleration in miles per hour	1.49	0.57
Minimum speed mph	5.0	6.2	7.3	Minimum acceleration	0.44	0
Maximum speed mph	10.3	10.8	10.8	Maximum acceleration	2.63	1.10

(1) Number of pictures in which the speed was measured between images 1 and 2.

(2) Number of pictures in which the speed was measured between images 2 and 3.

(3) Number of pictures in which the speed was measured between images 3 and 4.

(4) Number of times the stated increase in speed was measured, increase being the difference between the speeds as observed from images 2 and 3 and images 1 and 2.

(5) Number of times the stated increase in speed was measured, increase being the difference between the speeds as observed from images 3 and 4 and images 2 and 3.

to malfunctioning of the apparatus, I got only two images on a given negative. In most cases, however, I got three, and in about one-third of the pictures, there were four.

As I have indicated above, the feeding tray was seven inches long and the light beam four inches from one end of it. Thus the bird's take-off position could vary substantially. For example, if it took off from the far end of the tray and its head tripped the beam, it would have flown very nearly eleven inches before the first picture

TABLE 2  
SEQUENCE FLIGHT PICTURES—WHITE-BREASTED NUTHATCH

<i>Speed</i>		<i>Number of measurements</i>			<i>Acceleration</i>	<i>Number of</i>	
<i>In</i>	<i>In</i>	(1)	(2)	(3)	<i>Separation</i>	(4)	(5)
<i>meters</i>	<i>separation</i>				<i>in mm.</i>		
<i>per</i>	<i>on nega-</i>						
<i>second</i>	<i>tive in mm.</i>						
2.4	16	1	—	—	3	2	8
	17	—	—	—			
2.7	18	4	—	—	4	8	5
	19	2	—	—			
3.0	20	3	1	—	5	6	5
	21	3	1	—			
3.3	22	2	2	—	6	4	—
	23	3	1	—			
3.6	24	—	2	—			
	25	—	3	3			
3.9	26	1	5	1			
	27	1	3	1			
4.2	28	—	—	4			
	29	—	—	1			
4.5	30	—	—	3			
	31	—	—	3			
4.8	32	—	2	—			
	33	—	—	—			
5.1	34	—	—	—			
	35	—	—	2			
<i>Total measurements</i>		20	20	18	<i>Number</i>	20	18
<i>Average speed in</i>					<i>Average</i>		
<i>meters per second</i>		3.11	3.80	4.35	<i>separation</i>	4.6	3.8
<i>Average speed in</i>							
<i>miles per hour</i>		6.8	8.3	9.5	<i>Acceleration</i>		
<i>Minimum speed mph</i>		5.2	6.6	8.2	<i>in meters per</i>		
<i>Maximum speed mph</i>		8.9	10.5	11.5	<i>second</i>	0.69	0.57
					<i>Acceleration in</i>		
					<i>miles per hour</i>	1.5	1.2

(1) Number of pictures in which the speed was measured between images 1 and 2.

(2) Number of pictures in which the speed was measured between images 2 and 3.

(3) Number of pictures in which the speed was measured between images 3 and 4.

(4) Number of times the stated increase in speed was measured, increase being the difference between the speeds as observed from images 2 and 3 and images 1 and 2.

(5) Number of times the stated increase in speed was measured, increase being the difference between the speeds as observed from images 3 and 4 and images 2 and 3.

was taken, whereas if it took off from the edge of the tray nearest the beam, it would have flown something less than four inches. This I think explains the rather wide variation (between 5 and 10 mph) in the speed as measured between the first two images. Note, for example, that the speed as measured between images 3 and 4 is much more constant. I conclude from this that the bird approaches terminal velocity quite rapidly, and I would guess that for the chickadee, terminal velocity is somewhere around 11 mph and occurs after four or five wing beats. This is also borne out by measurements of ac-

celeration, in which the rate of increase of the bird's speed decreases quite rapidly between successive images.

With the nuthatch, on the other hand, the initial speed is somewhat less, and the final speed somewhat greater. The acceleration measurements indicate that the nuthatch is still speeding up as it flies out of the picture area. This is perhaps to be expected, since the nuthatch is a substantially bigger bird with larger wings and stronger wing action.

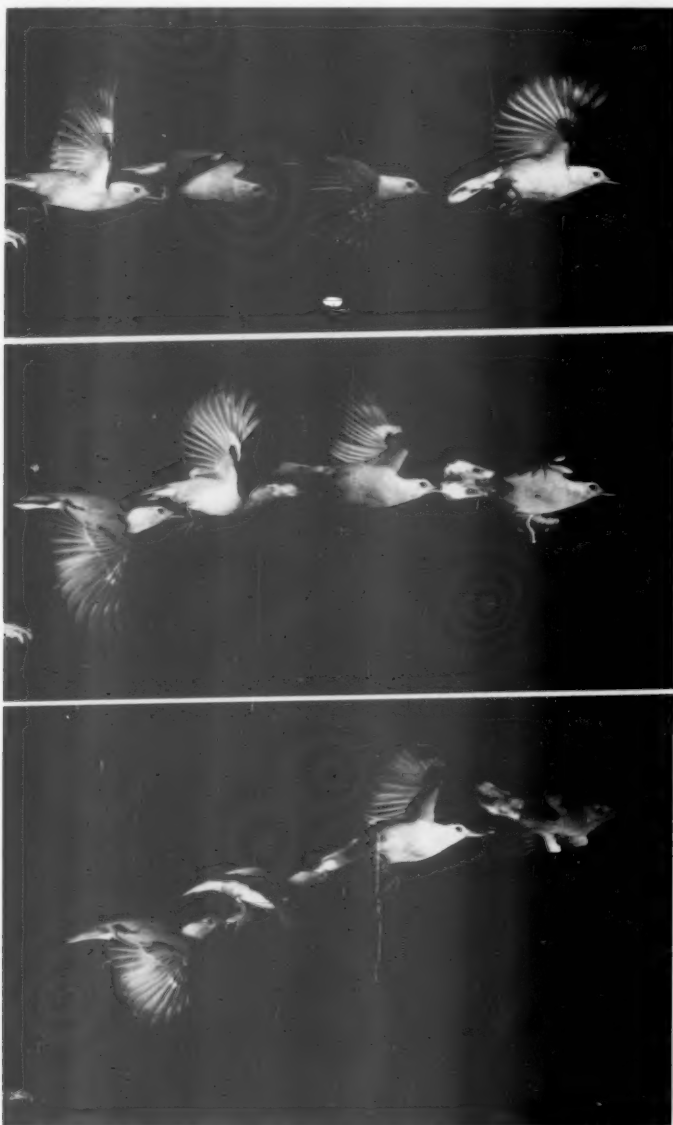
To reduce the variability of the first image with respect to the take-off position, I constructed a much smaller feeding tray. This tray was mounted on a vertical spring so arranged that the bird started the photographic apparatus as it kicked the tray in taking off. The two lower pictures in plate 1 were made in this way. While there are too few pictures taken in this series to justify statistical treatment, those which I have shown are rather constant initial speed which is near the lowest speeds calculated from pictures taken with the other apparatus. From these experiments and from some still pictures which I have taken, I would conclude that before taking off, a bird flexes its knees and raises its wings and that minimum flying speed is reached by the bird's hopping and simultaneously giving its wings a strong down-beat. Curiously enough, the take-off speeds of all the small birds which I have photographed are approximately the same, in the order of 5 mph.

The constancy of the wing position in successive pictures of the chickadee is remarkable (plate 2). The chance selection of 30 milliseconds as the interval between pictures coincided with the period between wing beats in this species. We can therefore conclude that the wings of this species beat 33 times per second and that there is in this rate remarkably little variation. I would estimate it to be plus or minus not more than five per cent. At least two different individuals were photographed.

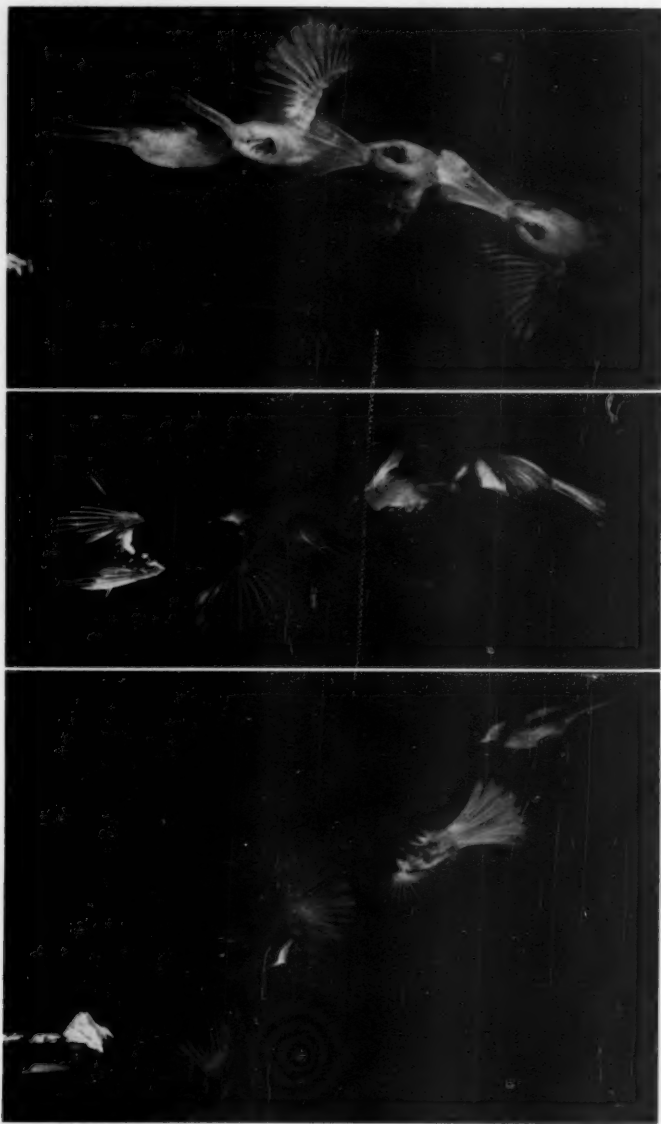
I did not determine the wing beat of the nuthatch with equal precision. This, however, was estimated by the position of the wing in successive pictures, and I arrived at a figure of 25 wing beats per second for this larger bird.

From these data, together with what Harold Edgerton has given me for the hummingbird and from what I have read about larger birds, I wonder if the speed of the wing tip would not turn out to be approximately constant irrespective of bird size. This seems justified, at least on the basis of a rough approximation; and it also seems reasonable from what I know of aerodynamic principles.

In nearly all of the pictures, the head of the bird points in the



WHITE-BREASTED NUTHATCHES IN FLIGHT. In this species, the interval between successive wing beats is greater than the 30-millisecond interval between the images



TUFTED TITMOUSE (*top*) AND BLACK-CAPPED CHICKADEES IN FLIGHT. Regardless of the position of the body, the head points in the direction of flight.

direction in which the bird is flying. This is quite independent of the position of its body; in fact, in some pictures the bird seems almost turned over on its back yet its head is right side up and quite clearly pointing in the direction of flight. The first image on plate 4, upper figure, shows a Tufted Titmouse (*Parus bicolor*) right side up; in the second, its body is turned toward the camera; in the third, it is completely upside down; and in the fourth, it has again turned so that its belly is facing the camera. The bird is banking away from the background, but the degree to which it has overcorrected seems quite unusual.

We also took some pictures in which the bird is coming in to the feeder. Originally, this was done to see how fast the bird's reactions might be (plate 4). This reaction must be extremely rapid, for between the first flash, which presumably frightened the bird, and the second flash, 30 milliseconds later, it had begun to change its course. Perhaps better evidence lies in the fact that when we take single pictures with the photobeam four inches from the edge of the feeding tray, the bird coming in for a landing is frightened and before reaching the tray is able to change his direction of flight rapidly enough to fly away without touching the feeder.

We are continuing to take photographs of this sort, hoping in due time to obtain similar data for our other winter visitors. I am also designing a high-speed moving-picture camera capable of accelerating to full speed in 1/100 second or less, in an effort to study more precisely the remarkable control and speed of reaction of these small birds.

*Greenville, Delaware, August 17, 1953.*

[Other articles on Mr. Greenewalt's work in the field of bird photography have appeared in *Colliers*, December 27, 1952, p. 66, and in *Audubon Magazine*, March-April 1954, p. 58.—EDITOR.]

THE GEOGRAPHIC DISTRIBUTION OF THE BLUE-EYED  
SHAGS, *PHALACROCORAX ALBIVENTER*  
AND *PHALACROCORAX ATRICEPS*

BY F. BEHN, J. D. GOODALL, A. W. JOHNSON, AND R. A. PHILIPPI B.

THE blue-eyed (or more correctly the "blue-eyelidded") shags comprise a group of cormorants widely distributed through the Pan-Antarctic Zone. After discussing the various forms in the light of the evidence then available, Murphy stated (Oceanic Birds of South America, p. 881, 1936): "In closing these general remarks upon a poorly understood group, I must hark back to a suspicion hinted at above, namely, that perhaps no more than two species of blue-eyed shags, divided along latitudinal convergences, and each with subspecies at numerous islands, may ultimately prove to encircle the southern oceans and to include all the New Zealand as well as the American forms."

It is the purpose of this article to present new evidence directly relevant to this problem and which, in our view, strikingly confirms Murphy's "suspicion" that all the various forms of blue-eyed shags of the Pan-Antarctic Zone pertain in reality to only two species, *Phalacrocorax albiventer* and *P. atriceps*.

*Differences and Identification.*—Although very similar in external appearance, the two species present in the adult, and more especially during the breeding season, constant differences which permit positive and accurate identification.

In *P. albiventer*, the line separating the black of the head from the white of the throat starts at the point of junction of the mandibles and extends horizontally backward across the cheek and auricular region. In *P. atriceps*, this line also starts from the junction of the mandibles, but instead of running horizontally across the cheeks, it extends upward almost vertically to a point just below the edge of the eyelid and from there backward. The black of the nape and hind neck is almost always narrower than in *P. albiventer*. As a result of these differences, the cheek and auricular region are white in *P. atriceps* and partially or wholly black in *P. albiventer*.

During the courtship period and until the prolonged breeding season is over, adults of *P. atriceps* show a squarish area of white feathers in the center of the lower back. This white area is never found in *P. albiventer*. In addition to this area, *P. atriceps* generally, but not always, develops a white alar bar.

The nasal caruncles are almost always much larger in *P. albiventer* than in *P. atriceps*, and this is especially true when specimens of *P.*



*albiventer* are compared with the Magellanic subspecies, *P. atriceps atriceps*, in which the caruncles are noticeably smaller than those of other races of the same species.

Although the two species are virtually identical in size and weight, the differences in the distribution of the black and white on the head and neck make *P. atriceps* appear longer and slenderer, especially when in flight. *P. albiventer* looks bulkier and less graceful, and although the difference is nothing but an optical illusion, we have found it surprisingly reliable for rapid identification.

*Distribution of P. albiventer.*—It is well established that the center of dispersal of this cormorant is in the Falkland Islands, where it is known as the King Shag and where large breeding colonies have been described by Cobb, Vallentin, and Beck. It is noteworthy that in these islands, no birds with the characters of *P. atriceps* (white cheeks and white dorsal patch) have ever been recorded.

From the Falkland Islands, the King Shag has spread east and west, but apparently not south, as all shags so far reported from the Antarctic islands of the American quadrant are races of *P. atriceps*. To the west, it is found at Staten Island, the Atlantic coast of Tierra del Fuego, the Straits of Magellan and adjacent land areas, the coast of Argentine Patagonia up to Puerto San Julian, and, during winter migrations, as far north as the province of Buenos Aires and the coast of Uruguay. To the southwest, it has also been reported from a number of islands south of the Beagle Channel, especially islands of the Cape Horn group, and from Bertrand, Carolina, and London islands (the last at long. 72° W.). In most of this area, *P. atriceps* is also found.

To the east of the Falklands, no doubt owing to a lack of islands suitable for breeding purposes, the penetration of *P. albiventer* is much less noticeable. Nevertheless, it has now been established that the shag colonies found on Crozet and Kerguelen islands in subantarctic latitudes of the Indian Ocean are races of *P. albiventer* (*P. a. vanhoeffeni* Reichenow and *P. a. verrucosus* Cabanis, respectively) and not separate species as had previously been supposed. *P. atriceps* is not present at either of these islands. It remains to be seen what cormorant of this group, if any, inhabits Gough Island. It is to be expected that it would also be a race of *P. albiventer*.

In any case, the typical race from the Falklands and southern South America should now be referred to as *P. albiventer albiventer*.

*Distribution of Phalacrocorax atriceps.*—Even as *P. albiventer* would appear to have originated in the Falkland Islands, all the evidence points to *P. atriceps* having had its origin in the Fuegian region

of southern Chile, from whence it has extended northward along the Pacific coast to lat. 37° S., south and southeast to the fringes of Antarctica and west along the Sub-Antarctic Convergence to the New Zealand quadrant.

The nominate race, comprising the main population, inhabits the entire Fuegian region, including the maze of islands and channels

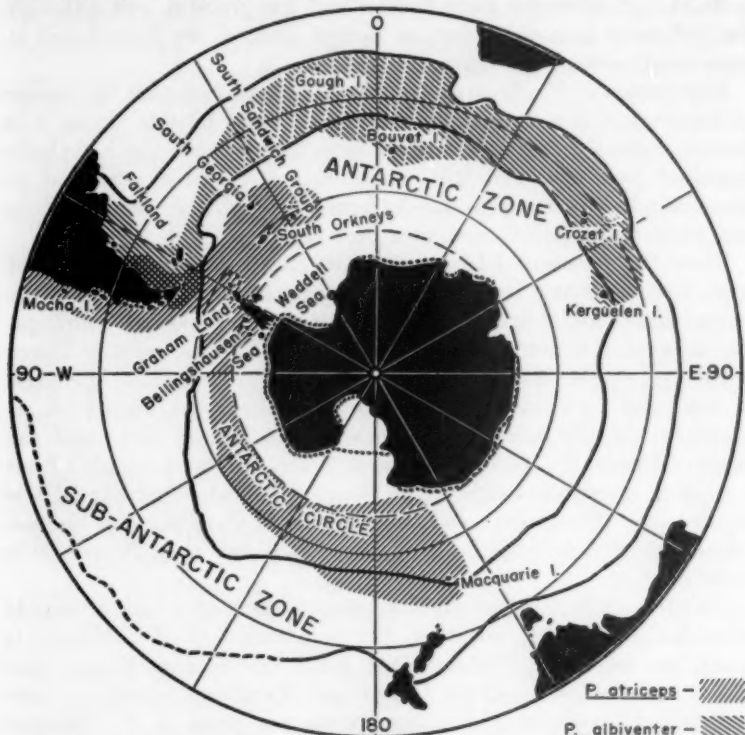


FIGURE 1. The world distribution of *Phalacrocorax atriceps* and *P. albiventer*.

extending to the southernmost extremities of the continent, the Pacific coast as far north as Santa Maria Island in the Bay of Arauco, the Straits of Magellan, and the Atlantic coast of Patagonia from Cape Dungeness to the Santa Cruz River at lat. 50° S. As will be seen later, in the eastern section of this extensive area, it shares common breeding grounds with *P. albiventer albiventer*.

In the different islands of the Antarctic Zone of the American quadrant, the blue-eyed shags are represented by subspecies of *P.*

*atriceps*, *P. albiventer* being absent altogether. Thus at South Georgia, we have *P. atriceps georgianus* Lönnberg, which differs from the typical race in having a shorter bill, much larger nasal caruncles (approximating those of *P. albiventer*), and the line of demarcation between the black and white on the head lower down, with the black area covering the opening to the ear.

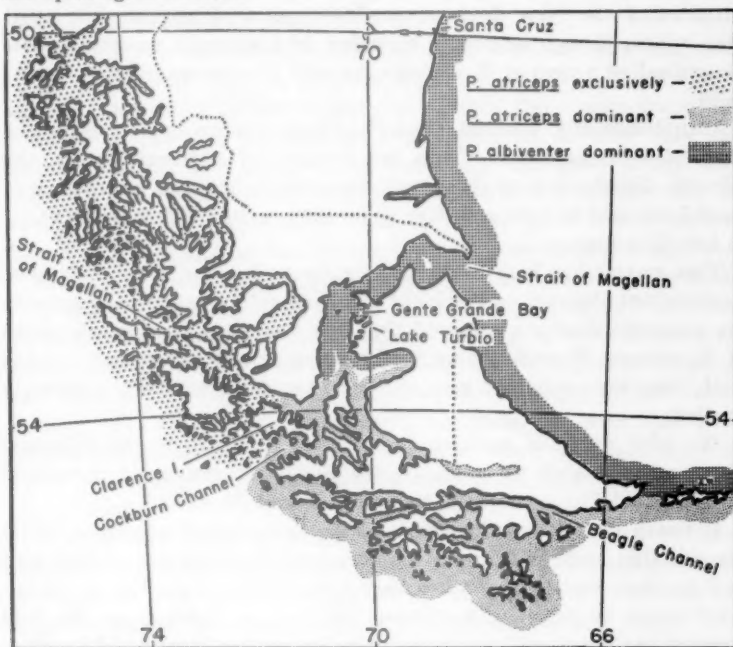


FIGURE 2. The distribution of *Phalacrocorax atriceps* and *P. albiventer* in southern South America.

In the South Shetlands and ranging south in Graham Land to lat. 67° S. the local race is known as *P. atriceps bransfieldensis* Murphy and is characterized by a longer bill than in *P. a. georgianus* and consistently larger size as can readily be seen from the following measurements of 8 specimens secured by us in Graham Land and Greenwich Island (between lat. 62° and 65° S.) from January to March, 1952.

Weight, 2994 gm. (2750–3250)

Wing, 325 mm. (320–330)

Bill, 59 mm. (57–62.5)

Tail, 146 mm. (136–158)

The caruncles are also larger than in *P. a. atriceps*, and the tail is obviously longer than in *P. a. atriceps* or *P. a. georgianus*.

In the South Sandwich Islands and South Orkneys, *P. atriceps* is also abundant, but, as far as we are aware, it has not yet been satisfactorily determined whether this form is part of the *georgianus* or *bransfieldensis* populations or whether it constitutes a separate endemic race peculiar to these islands.

Finally, far to the west, at Macquarie Island in sub-antarctic latitudes of the New Zealand quadrant, we find another blue-eyed shag which, though originally classified as a separate species, is now recognized as a race of *P. atriceps*, namely *P. atriceps traversi* Rothschild.

*Distribution of P. albiventer and P. atriceps atriceps in the overlapping zone.*—On the island of Tierra del Fuego and adjacent waters, the relative distribution of these two cormorants acquires characters of special interest as here and here alone they occupy the same territory as breeding species.

This matter has long been open to discussion, for while Reynolds, a competent observer and resident on the island for many years prior to his untimely death, considered that the two were merely subspecies of *P. atriceps*, Murphy came to the opposite conclusion and insisted that they were separate species even though superficially extremely similar.

We offer as proof positive that Murphy was right the following observations which we made on the northwest corner of the island of Tierra del Fuego between November 8 and 28, 1952.

Between the port of Porvenir and the sheep ranch known as Gente Grande (big men) are three long lakes lying between low, rolling hills and so close one to the other that a relatively slight rise in water-level would be sufficient to connect the Bay of Porvenir on the west coast of the island with Gente Grande Bay on the Straits of Magellan. Near the middle of the last of these lakes, that is to say the one nearest to the Straits, known as Lake Turbio, is a low, oval island some 1500 square meters in extent. With the exception of a small area of higher stony ground near the western end, the entire surface of this island is covered with cormorants' nests, extending in rows of mathematical precision from water's edge to water's edge and with almost exactly a foot of space between one and the next steep sided, truncated cone. These cones are built of seaweed and other vegetable matter, and by use and weathering become caked into a hard and solid mass of dried vegetation, earth, and guano. It is obvious that the same cones are used year after year with nothing more than the addition of a little fresh material around the periphery and lining for the actual nest.

So regular is the master plan of construction of the colony that

it was an easy matter to calculate the total number of nests—in round figures 8,000. Of these, approximately two-thirds were occupied at the time of our visit and, most remarkable, starting from the northeast end of the island, every nest had an owner until the top third of the colony was reached. From there onwards, the truncated cones continued, row upon row, and yet in all this top third not one nest had an occupant!

In the lower two-thirds, where the birds were in residence, every stage of the reproductive process might be observed, from the arranging of freshly gathered material around the saucer-shaped depression on the tops of the cones to the presence of more than half-grown young. The majority of the nests contained either three eggs or three young birds. However about one nest in every five had two eggs or two young only. On the other hand five nests were found with four eggs or four young birds and two with five eggs each.

As may be seen from the photographs, the occupants of the colony paid so little attention to us that it was almost possible to touch them with the hand; and as we picked our way among the rows of truncated cones, only the birds nearest to us left their nests, flying off to windward and returning to resume their brooding the moment we had moved further on. Thanks to this extreme tameness, we were able to establish beyond all possibility of doubt the presence of both *P. albiventer* and *P. atriceps* in the colony and determine the approximate proportion of each.

The colony comprised a majority of *P. albiventer*, with not more than two percent of the nests occupied by *P. atriceps*, these being interspersed here and there apparently at random and without any trace of separation into groups or segregation of any kind. Thus each of these white-cheeked, white-rumped birds might be observed surrounded on all sides by examples of *P. albiventer*. There was no visible difference in size, and of the four specimens collected on the nests for purposes of positive identification, one of each species weighed 5 lbs. 14 oz. and the other two, also one of each species, 5 lbs. 10 oz. All four specimens, shot at 9 A.M., proved to be males, which would tend to indicate that the females incubate during the night and are relieved by the males in the early morning.

The birds obtained their food and also the nesting material from the salt water of the Straits of Magellan and the Bay of Porvenir, at a distance of one mile and twelve miles, respectively. No birds were observed at any time fishing in the lake.

From a stretch of higher ground situated on the direct route between the lake and the sea, it was interesting to watch the continual coming

and going of the cormorants, sometimes singly or in twos and threes and at other times in flocks of 20, 30, or even more, and note how on the homeward journey they invariably sought to gain altitude before making the land crossing. The reason for this soon became obvious; two pairs of Chilean Skuas (*Catharacta skua chilensis*) were lying in wait and would rise in the air and dive on the hapless cormorants to make them disgorge their loads of fish. We later found the nest of one pair of these skuas on the shores of the lake directly beneath the cormorants' flyway.

The discovery and investigation of this colony, which local residents assured us has been in existence for at least 50 years, shows that *P. albigaster* is present as an abundant breeding species at least as far west as long. 70°. Also, we feel certain that when an investigation can be made of the large cormorant colony known to exist on Magdalena Island, situated in the Straits of Magellan directly opposite the colony visited by us, it will be found that *P. albigaster* is the predominant breeding species and not *P. atriceps* as hitherto supposed. This island was visited and the cormorant colony commented upon by Cunningham as far back as 1871, but from his notes it is not possible to identify the species.

In any case, the information already available renders necessary a revision of previously accepted views as to the relative abundance of one or the other of these two species in the regions where their areas of distribution overlap.

It is our opinion that *P. albigaster* should be regarded as the dominant species in the comparatively dry zones which characterize eastern and northern Tierra del Fuego, the Straits of Magellan as far west as parallel 71, and the Patagonian coast from the eastern entrance to the Straits north to the Santa Cruz River. *P. atriceps*, on the other hand, is unquestionably the dominant species in the areas of much heavier precipitation comprising southern Tierra del Fuego, the Beagle Channel, the Cape Horn region, and the labyrinth of islands and channels leading westward to the Pacific Ocean. In this zone, the most westerly known penetration of *P. albigaster* is at London Island, near the Pacific entrance to the Cockburn Channel at long. 72°. As a breeding species, it is not known west of the colony described in this article.

The accompanying map of the pan-antarctic regions is intended to give a general idea of the respective areas of distribution of the two species of blue-eyed shags, while the larger scale inset shows in more detail the relative distribution of each in the "critical" area where the two are found together.





BLUE-EYED SHAGS AT COLONY IN NORTHWESTERN TIERRA DEL FUEGO. (Top) In the foreground, an adult *Phalacrocorax albiventer* in a defensive display. Above and to the right, an incubating *P. atriceps*, showing more white on the side of the head. (Bottom) Close-up of *P. atriceps*, showing the white patch on the back and the white alar bar.



BLUE-EYED SHAGS AT COLONY IN NORTHWESTERN TIERRA DEL FUEGO. (Top) General view of the colony. (Center) Nest and eggs of *Phalacrocorax albiventer*. (Bottom) Nest of *P. albiventer* with newly hatched young, November, 1952.



*Summary.*—The blue-eyed shags of pan-antarctic latitudes were originally considered to belong to 4 or 5 species or, with subspecies, as many as a dozen different forms. Subsequent investigations, and especially that of Murphy, have shown that in all probability there are only two good species, *P. atriceps* and *P. albiventer*, each with a number of insular subspecies.

Although extremely similar birds, close examination and acquaintance show that there are certain constant differences which permit positive identification, even in the field.

*P. albiventer*, centering on the Falkland Islands, is found westward to parts of Tierra del Fuego, islands south of the Beagle Channel and the Straits of Magellan, and eastward to Crozet and Kerguelen islands in the Indian Ocean. *P. atriceps* has its center of dispersal in the Fuegian region of southern Chile and has spread southward to the approaches to the Antarctic Continent, northward to the coast of south-central Chile, and westward to Macquarie Island in the New Zealand quadrant.

An overlapping zone common to both species is found in Tierra del Fuego, the Straits of Magellan, and along the coast of Patagonia as far north as the Santa Cruz River at lat. 50° S. This zone is discussed in detail, and a large nesting colony discovered on the northwest corner of the island of Tierra del Fuego is described. This colony consisted mostly of *P. albiventer* with less than two per cent of *P. atriceps*, thus upsetting previous concepts that *P. albiventer* was merely an occasional visitor to the Magellanic area.

The writers reach the conclusion that the range of *P. albiventer* as the dominant species must be extended to include the comparatively dry zones of eastern and northern Tierra del Fuego and the Straits of Magellan as far west as parallel 71, while *P. atriceps* should be regarded as predominant in the areas of much heavier precipitation to the west of this line and from the Beagle Channel southward.—*Santiago, Chile, August, 1953.*

NORTH AMERICAN MIGRANTS IN THE STATE OF  
VERACRUZ, MEXICO: A SUMMARY

BY FREDERICK W. LOETSCHER, JR.

PRIOR to the appearance of a comprehensive report, now in preparation, on the more than 700 forms of birds known from Veracruz, it seems desirable to summarize the present status there of migrants from the north. It is hoped that this summary may prove useful to students of North American and Mexican birds, and at the same time by revealing gaps in our knowledge of migratory birds in Veracruz, that it may stimulate further work in this interesting, readily accessible, region.

*Scope.*—Essentially, this paper is limited to birds of the A.O.U. Check-List (4th ed., 1931, and nineteenth through twenty-eighth supplements) which have been found in Veracruz but are not known to breed there. All but two, Wilson's Petrel (*Oceanites oceanicus*) and the Black-headed Gull (*Larus ridibundus*), nest in North America.

For completeness, I have included the following migratory forms whose breeding status in Veracruz remains to be determined: Eastern Least Bittern (*Ixobrychus exilis exilis*), Florida Common Gallinule (*Gallinula chloropus cachinnans*), Wilson's Thick-billed Plover (*Charadrius wilsonia wilsonia*), Northern Black Skimmer (*Rynchops nigra nigra*), and American Barn Swallow (*Hirundo rustica erythrogaster*).

Certain other species, for example the Rough-winged Swallow (*Stelgidopteryx ruficollis*), have one or more migratory northern races and another form nesting in Veracruz. In such cases, I have listed the northern race(s) when represented by critically determined Veracruz specimens.

Among the migratory or partially migratory North American forms omitted from this summary for the reason that their breeding in Veracruz is established or quite probable are the Pied-billed Grebe (*Podilymbus podiceps* subspecies?), Eastern Green Heron (*Butorides virescens virescens*), Black-crowned Night Heron (*Nycticorax nycticorax hoactli*), Yellow-crowned Night Heron (*Nyctanassa violacea violacea*), Masked Duck (*Oxyura dominica*), White-tailed Hawk (*Buteo albicaudatus hyospodius*), American Coot (*Fulica americana americana*), Black-necked Stilt (*Himantopus mexicanus*), Western Burrowing Owl (*Speotyto cunicularia hypugaea*), and Eastern Varied Bunting (*Passerina versicolor versicolor*).

I have tried to indicate each bird's relative abundance in Veracruz, and, where sufficient data exist, its altitudinal preference and season(s)

of occurrence. Unfortunately, for more than one-half of the 243 migrants treated, no representative fall dates are available to show when these birds arrive in Veracruz, southbound, and, in the case of most of the transients, to show when they leave the state for their Central or South American wintering grounds. Spring migration dates are much more plentiful, though far from adequate. The omission of dates, whether for fall or spring or both, indicates that representative Veracruz migration dates for these seasons are lacking, so far as I am aware.

In assembling the data for this report it is hoped that only a small number of records published before 1953 have been overlooked. Obviously, however, specimens in collections which I have not had the opportunity of examining, and field observations not known to me would doubtless alter the status of a number of these birds and add others to the list.

*Sources of Data.*—Principally four, as follows:

1. Contact with many people who have kindly shared their knowledge with me.
2. Field trips to central and southern Veracruz in 1937 (July 27 to September 1) and 1939 (February 27 to June 27), and to northern and central Veracruz in 1952 (June 26 to August 9). All sight records, unless otherwise stated, were made by the writer. For many of the less common migrants, when readily identifiable in life, I have listed all of my observations; for the commoner migrants I have as a rule incorporated my field notes in the summary without actually referring to them. Similarly, I have mentioned specimens personally taken only when they represent unusual occurrences or dates.
3. Study of pertinent literature.
4. Studies, conducted chiefly in 1938 and 1950, of most Veracruz birdskins now in the United States, with the important exception of the Robert T. Moore Collection.

In the museums listed below I have been privileged to examine all or nearly all bird specimens from Veracruz (also many from adjacent areas), including mounted birds as well as study collections. To indicate the location of specimens *personally examined*, I have employed the alphabetical symbols originated by Friedmann, Griscom, and Moore (1950: 7). Since I have not visited the Dickey Collection, Moore Collection, or British Museum, letters B, K, and M, respectively, are omitted, as is letter I, now that the U. S. Fish and Wildlife Service Collection is being merged with that of the U. S. National Museum. For the last five museums below, which are not

listed by Friedmann, Griscom, and Moore, I have used additional letters as follows:

- A. University of Michigan Museum of Zoology
- C. G. M. Sutton Collection
- D. Cornell University Collection
- E. Louisiana State University Museum of Zoology
- F. Museum of Comparative Zoology, Harvard University
- G. United States National Museum (including the United States Fish and Wildlife Service Collection)
- H. American Museum of Natural History
- L. Museo Nacional de Historia Natural, México, D.F. (only mounted birds examined)
- N. Chicago Natural History Museum
- P. Academy of Natural Sciences, Philadelphia
- Q. Princeton University Museum of Zoology
- R. University of Kansas Museum of Natural History
- S. Kansas State Historical Society, Topeka (mounted birds only, Goss Collection)
- T. Department of Fish and Game, Agricultural and Mechanical College of Texas, College Station

*Acknowledgements.*—I am very grateful to the authorities of the above-named institutions for allowing me free access to the collections under their care and for facilitating my studies in every way. Without the kind coöperation of the following men this report would have been impossible: John W. Aldrich, Dean Amadon, Emmet R. Blake, James Bond, William B. Davis, H. G. Deignan, R. M. de Schauensee, Allen J. Duvall, Herbert Friedmann, James C. Greenway, Jr., E. Raymond Hall, George H. Lowery, Jr., Robert J. Newman, James L. Peters, A. L. Rand, Charles H. Rogers, Robert W. Storer, George Miksch Sutton, Harrison B. Tordoff, Josselyn Van Tyne, and John T. Zimmer.

In addition, for courtesies during the assembly of data for this report I should like to thank Arthur A. Allen, Pierce Brodkorb, Walter W. Dalquest, Ludlow Griscom, Melvin A. Traylor, Jr., and Juan Zinser.

I take especial pleasure in acknowledging my indebtedness to George B. Saunders of the U. S. Fish and Wildlife Service in providing up-to-date summaries, based chiefly on his numerous aerial surveys, of the status of migratory waterfowl and certain other birds in Veracruz. In a number of cases his data have shown that migrants supposed to be rare in Veracruz, or previously unrecorded there, are actually

regular and, in some cases, common. He has very generously permitted me to quote freely from his letter to me, dated August 25, 1953. In the Anatidae, such quotations are followed by "(Saunders)."

Dr. Alexander Wetmore very kindly furnished up-to-date vernacular names and also checked the scientific names appearing in the annotated and hypothetical lists of this report. These names are from the manuscript list of the A.O.U. Committee on Classification and Nomenclature. However, the writer alone is responsible for any errors.

Both the 1950 museum work and the 1952 field trip to México were made possible by joint grants from the Carnegie Foundation Research Fund and Centre College of Kentucky.

*Discussion.*—In an area as diversified as Veracruz, with its warm, partly arid, 400-mile coast line on the east, and its cool, predominantly humid mountains rising to peaks of more than 13,000 and 18,000 feet on the west, much remains to be learned about each migrant's geographical and ecological preferences while in México. Nevertheless, a few general remarks may be in order.

Certain continent-wide birds such as the Marsh Hawk (*Circus cyaneus*), Sparrow Hawk (*Falco sparverius*), Killdeer (*Charadrius vociferus*), and Lincoln's Sparrow (*Melospiza lincolni*) are found during the winter in unforested country throughout Veracruz, though more numerous at lower altitudes. In the case of most of the wide-ranging water birds and shore birds, the near absence of attractive bodies of water in the Veracruz mountains results in their being largely restricted to the coastal plain. As to the smaller land birds, we find that the highlands of west-central Veracruz (Mount Orizaba and Cofre de Perote districts) are the principal winter home in Veracruz of migrants from western North America. The following twenty forms, for example, are as yet unknown elsewhere in the state, even though nearly half of them have been found repeatedly in the Veracruz mountains.

- Black-chinned Hummingbird (*Archilochus alexandri*)
- Rufous Hummingbird (*Selasphorus rufus*)
- Northern Cassin's Kingbird (*Tyrannus v. vociferans*)
- Southern Say's Phoebe (*Sayornis s. saya*)
- Hammond's Flycatcher (*Empidonax hammondi*)
- Wright's Flycatcher (*Empidonax oberholseri*)
- Desert Rough-winged Swallow (*Stelgidopteryx ruficollis psammochrous*)
- Azure Common Bluebird (*Sialia sialis fulva*)
- Pacific Audubon's Warbler (*Dendroica a. auduboni*)
- Black-throated Gray Warbler (*Dendroica nigrescens*)

Townsend's Warbler (*Dendroica townsendi*)  
Hermit Warbler (*Dendroica occidentalis*)  
Northern Grace's Warbler (*Dendroica g. graciae*)  
Common Bullock's Oriole (*Icterus b. bullockii*)  
Brewer's Blackbird (*Euphagus cyanocephalus*)  
Western Tanager (*Piranga ludoviciana*)  
Nevada Savannah Sparrow (*Passerculus sandwichensis nevadensis*)  
Rock Rufous-crowned Sparrow (*Aimophila ruficeps eremoeca*)  
Western Chipping Sparrow (*Spizella passerina arizonae*)  
Worthen's Sparrow (*Spizella wortheni*)

By comparison, the known Veracruz range of only two eastern North American forms is similarly restricted to the mountainous west-central part of the state. These two are the Acadian Flycatcher (*Empidonax virescens*) and Eastern Blue Grosbeak (*Guiraca c. caerulea*), the former being known from a single Veracruz specimen.

Because migrants from western North America nearly all winter in México and northern Central America, there are comparatively small numbers of them south of Veracruz at that season. Consequently, during the spring migration no pronounced increase in their numbers is apparent in Veracruz, an area which is, moreover, presumably not on the main flyway between Guatemala and the western United States. As a rule, migrants bound for western North America gradually disappear from Veracruz during April, whereas, in a great many cases, birds going to eastern North America not only remain well into May, but become noticeably commoner during the first days of that month, as their numbers are steadily augmented by individuals arriving from Central and South America. These were the transients with which the woods near Jalapa became increasingly alive, in 1939, until a peak was reached about May 5 to 10, suggestive of a fair-sized spring "wave" in New Jersey. Making allowances for the heavier foliage in México, the transients' comparative silence there, and the presence of so many native species which largely occupy one's attention, it seems to me altogether likely that at least as many transients pass through favorable parts of Veracruz as through most areas of comparable size in central or eastern United States. What might be considered supporting evidence for this surmise is found in the statement of Lowery (1951: 440) in his quantitative study of nocturnal bird migration: "April flight densities at Tampico are the highest recorded in the course of this study."

A point worth emphasizing is that migrants, at least in spring, are very plentiful not only along the Veracruz coast, but also on the eastern slopes of the mountains 50 or 60 miles inland. It should also

be stressed that the scarcity of records for certain species is undoubtedly due more to lack of sufficient field work than to the birds' rarity or absence in Veracruz. For examples of migrants recently found to be common, see summaries of the Ring-necked Duck (*Aythya collaris*) and Mourning Warbler (*Oporornis philadelphia*).

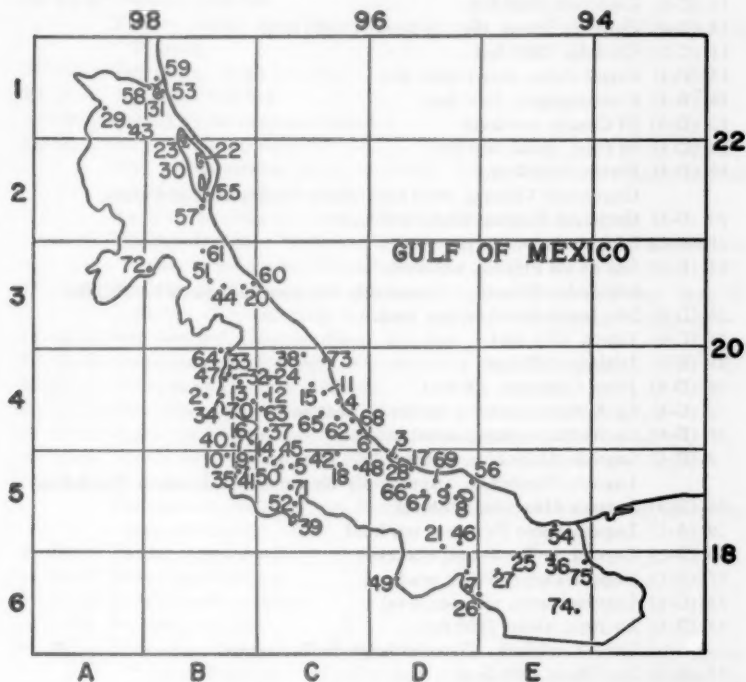


FIGURE 1. Sketch-map of state of Veracruz, México, showing localities numbered in the gazetteer.

*Gazetteer of Localities.*—The following place names are mentioned in this paper. Those here numbered are to be found on the accompanying sketch-map. For example, the approximate location of Achotal, number 1, may be found in square D-6. In most cases, the approximate altitude in feet is given after the place name. All localities are in Veracruz unless stated otherwise.

- 1 (D-6) Achotal, about 300 feet.
- 2 (B-4) Alchichica, Puebla, 8000 feet.
- 3 (D-5) Alvarado, sea-level.
- 4 (C-4) Antigua, near sea-level.
- 5 (C-5) Atoyac, 1500 feet.
- 6 (C-4) Boca del Río, sea-level.



- 7 (D-6) Buena Vista, about 200 feet.  
Cacalilao, near sea-level in state of Veracruz shortly west of Tampico.
- 8 (D-5) Catemaco, 1100 feet.
- 9 (D-5) Cerro de Tuxtla, rises to about 4000 feet.
- 10 (B-5) Chalchicomula, Puebla, 8200 feet.
- 11 (C-4) Chichicastle, 500 feet.
- 12 (C-4) Coatepec, 4100 feet.
- 13 (B-4) Cofre de Perote, rises to about 13,500 feet.
- 14 (C-5) Córdoba, 2800 feet.
- 15 (C-4) Corral Falso, about 4000 feet.
- 16 (B-4) Coscomatepec, 5000 feet.
- 17 (D-5) El Conejo, sea-level.
- 18 (C-5) El Faro, about 600 feet.
- 19 (B-5) Fortín, 3200 feet.  
Guadalupe Victoria, 8000 feet; about 3 miles west of Perote.
- 20 (B-3) Gutiérrez Zamora, about 200 feet.
- 21 (D-5) Isla, about 400 feet.
- 22 (B-2) Isla de los Frijoles, sea-level.  
Isla de los Pájaros. Presumably the same as Isla de los Frijoles.
- 23 (B-2) Isla Juana Ramírez, sea-level.
- 24 (C-4) Jalapa, 4500 feet.
- 25 (E-6) Jaltipán, 100 feet.
- 26 (D-6) Jesús Carranza, 200 feet.
- 4 (C-4) La Antigua (same as Antigua), near sea-level.
- 27 (E-6) La Buena Ventura, about 200 feet.
- 2 (B-4) Lago de Alchichica, Puebla, 8000 feet.  
Lago de Tamiahua. Apparently the same as Laguna de Tamiahua.
- 28 (D-5) Laguna Alvarado, sea-level.
- 29 (A-1) Laguna Cerro Pez, near sea-level.
- 30 (B-2) Laguna de Tamiahua, sea-level.
- 31 (B-1) Laguna Pueblo Viejo, sea-level.
- 73 (C-4) Laguna Verde, near sea-level.
- 32 (B-4) La Joya, about 7000 feet.  
Lake Tamiahua. Same as Lago de Tamiahua.
- 33 (B-4) Las Vigas, 8000 feet.
- 34 (B-4) Limón, 8000 feet.
- 35 (B-5) Maltrata, about 6000 feet.
- 36 (E-6) Minatitlán, 100 feet.
- 37 (C-4) Mirador, 3800 feet.
- 38 (C-4) Misantla, 1350 feet.
- 39 (C-5) Motzorongo, 800 to 2000 feet.
- 40 (B-4) Mount Orizaba, rises to 18,320 feet. Partly in Veracruz, but peak in Puebla.
- 74 (E-6) Nanchital, about 100 feet.
- 41 (B-5) Orizaba (city of), 4000 feet.  
Pajaros Island. Same as Isla de los Pájaros.
- 42 (C-5) Palma Sola, about 1700 feet.
- 43 (A-1) Pánuco, near sea-level.  
Papaloapan basin or Papaloapan delta, near sea-level. "Includes the vast complex of lagoons, marshes, and streams in the great delta south of Alvarado." (G. B. Saunders, *in litt.*)



- 44 (B-3) Papantla, 600 feet.
- 45 (C-5) Paraje Nuevo, 1800 feet.
- 46 (D-5) Paso Nuevo, about 300 feet.
- 47 (B-4) Perote, 8000 feet.
- 48 (C-5) Piedras Negras, 400 feet.
- 49 (D-6) Playa Vicente, about 1500 feet.
- 50 (C-5) Potrero, 1700 feet.  
Potrero Viejo, 1700 feet. About 1 mile south and 3 miles west of Potrero.
- 51 (B-3) Poza Rica, about 500 feet.
- 52 (C-5) Presidio, 1600 feet.
- 53 (B-1) Pueblo Viejo, near sea-level.
- 54 (E-5) Puerto México, sea-level.  
Río Coatzacoalcos, near sea-level. Flows by Jesús Carranza and Minatitlán to Puerto México.  
Río Pánuco, near sea-level. Flows by Pánuco to Tampico.  
Río Papaloapan. Flows in a northeasterly direction across the state to empty into Laguna Alvarado.
- 55 (B-2) Romatlan. Rivera, near sea-level; location on sketch-map open to doubt. Not definitely determined, but said to be near Córdoba.
- 75 (E-6) San José del Carmen, about 250 feet.
- 26 (D-6) Santa Lucrecia, 200 feet. Old name for Jesús Carranza.
- 56 (D-5) Santecomapan, about 500 feet.
- 57 (B-2) Tamiahua, near sea-level.
- 30 (B-2) Tamiahua Lagoon, sea-level. Same as Laguna de Tamiahua.
- 58 (A-2) Tamós, near sea-level.
- 59 (B-1) Tampico, Tamaulipas, sea-level.  
Tecamaluco, 4600 feet. A Sumichrast locality in mountains above the city of Orizaba.
- 60 (B-3) Tecolutla, sea-level.
- 61 (B-3) Tehuatlán, 700 feet.
- 62 (C-4) Tejería, near sea-level.
- 63 (C-4) Teocelo, 4000 feet.
- 64 (B-4) Teziutlán, Puebla. The city itself is in Puebla, but in this report "east of Teziutlán" refers to birds collected by Melvin A. Traylor, Jr. in Veracruz along the highway to Nautla, mostly between altitudes of 4500 and 5000 feet.
- 65 (C-4) Tierra Colorada, about 650 feet.
- 66 (D-5) Tlacotalpam, near sea-level.
- 67 (D-5) Tres Zapotes, 200 feet.
- 68 (C-4) Veracruz (city of), sea-level.
- 69 (D-5) Volcán San Martín, rises to about 5500 feet.
- 70 (B-4) Xico (sometimes spelled Jico), 4100 feet up to 6500 feet on nearby mountains.
- 71 (C-5) Xúchiles, about 1800 feet.
- 72 (B-3) Zacualpilla, 6500 feet.

In the annotated list of North American migrants recorded from Veracruz, an asterisk (\*) preceding a bird's name signifies that every *original* Veracruz record for that form, so far as known to me, is here

listed. Two asterisks (\*\*) mean that while all Veracruz occurrences known to me are given, at least one record for each bird so designated is cited indirectly by reference to standard compilations like the *Biologia Centrali-Americana*, or Ridgway and Friedmann's *The Birds of North and Middle America*. Birds with no asterisk are usually common forms whose status is summarized without attempting to list each Veracruz record.

\*\*American Eared Grebe, *Colymbus caspicus californicus*.—Little known, but probably regular on mountain ponds at all seasons. Ferrari-Perez (1886: 179) took a young male at Jalapa in August, and Friedmann, Griscom, and Moore (1950: 13) state that it has been "collected in Veracruz in full breeding dress." On the Lago de Alchichica, Puebla, a crater lake shortly west of Limón, Veracruz, I counted 87 on July 20, 1952. Though many were in nuptial plumage, no half-grown young or other evidences of nesting were noted.

\*\*Atlantic Wilson's Petrel, *Oceanites oceanicus oceanicus*.—Presumably regular offshore. Beebe (1905: 19) noted several inside Veracruz harbor during a severe "norther" in late December. Friedmann, Griscom, and Moore (1950: 18) write: "Recorded off the coast of Veracruz."

White Pelican, *Pelecanus erythrorhynchos*.—Regular coastal winter visitant and inland transient. Chapman (1930: 184) in mid-March has noted "flocks containing thousands of birds passing northward along the eastern face of the Sierras of Vera Cruz." Recorded between November 12 (Low, Kay, and Rasmussen, 1950: 351) and April 16 (Wetmore, 1943: 232).

\*\*Gannet, *Morus bassanus*.—Probably casual in winter (*cf.*, Bent, 1922: 229; and Friedmann, Griscom, and Moore, 1950: 22). Beebe (1905: 381) reported Gannets seen from his steamer "all the way from Cape Hatteras to Vera Cruz."

(Northern) Great Blue Heron, *Ardea herodias (herodias)*.—The species is uncommon but regular at nearly all seasons, chiefly on coastal plain, sparingly up to 4500 feet or more. Noted by me only at Isla in mid-March, and near Tamós on July 1. Cooke (1946: 254) has recorded one banded at Imperial Beach, Saskatchewan, July 5, 1936, and recovered on January 24, 1938, at Lake Tamiabua.

\*Anthony's Green Heron, *Butorides virescens anthonyi*.—Status obscured by resident *virescens*, but perhaps a regular winter visitant. So far two records: a female from Piedras Negras, December 19 (Lowery and Dalquest, 1951: 546), and an Orizaba specimen listed by Oberholser (1912: 545).

\*American Bittern, *Bolaurus lentiginosus*.—Rare in winter; the only records are from Córdoba (Slater, 1856b: 310), Jalapa (Slater, 1859a: 369), and Orizaba (Sumichrast, 1881: 233).

\*Eastern Least Bittern, *Ixobrychus exilis exilis*.—Probably a regular transient or winter visitant; may breed, but the only records so far are a male (wing 115 mm., tail 40, bill 46) and female (112, 36, 44), both taken near Rivera on April 12, 1904 (G).

Lesser Canada Goose, *Branta canadensis leucopareia*.—"Very local, but recorded regularly in winter surveys near Tampico. A few usually observed on flats near Tamiabua and on meadows in southern part of Papaloapan basin." (Saunders).

\*Athabaska Canada Goose, *Branta canadensis parvipes*.—Status uncertain; the type specimen from "Vera Cruz" seems to be the only state record.

Richardson's Goose, *Branta hutchinsii hutchinsii*.—"Rare in winter in coastal areas of northeastern Veracruz. Hunters in the Tampico area have reported killing

several very small Canada Geese. A specimen obtained at the Tampico public market from a local hunter, March 10, 1940, had been shot near Cacalilao, Veracruz." (Saunders).

Pacific White-fronted Goose, *Anser albifrons frontalis*.—"Regular but scarce and local in winter; more common as a transient, especially in northern Veracruz. Recorded regularly in the vicinity of Tampico and Tamiahua, and in the Papaloapan delta." (Saunders).

Lesser Snow Goose, *Chen hyperborea hyperborea*.—"Regular and fairly common in winter south to the Papaloapan delta (cf. Saunders, 1953: 84-85). See next species.

Blue Goose, *Chen caerulescens*.—"Regular but scarce in winter, usually in company with much larger numbers of Snow Geese. Most often observed near Tampico, but a few were usually recorded near Tamiahua and in the Papaloapan delta. On the January, 1947, aerial inventory, 37 were observed in the vicinity of Papaloapan; on the January, 1952, survey, 250 were recorded in that section." (Saunders.)

Northern Fulvous Tree Duck, *Dendrocygna bicolor helva*.—"Regular but very local in winter. Several hundred were usually recorded at lagoons near Tampico during winter surveys, and smaller numbers on marshes near Laguna de Tamiahua, freshwater lagoons near Veracruz, and marshes of the Papaloapan delta. Natives reported that small numbers nested in the vicinity of Laguna Pueblo Viejo and Laguna de Tamiahua, usually in clumps of *Spartina* (species?). I was never there in summer to try to verify this." (Saunders).

Common Mallard, *Anas platyrhynchos platyrhynchos*.—"Rare in winter in north-eastern Veracruz, where several have been taken by hunters near Tampico. However, all of the experienced hunters there attest to the rarity of this species." (Saunders).

There is an old record for Jalapa (Sclater, 1859a: 369), and I have seen two Jalapa skins (L).

Gadwall, *Anas strepera*.—"Common in winter, especially in coastal lagoons of the northeastern part of state. Formerly the western side of Laguna de Tamiahua was the Gadwall's principal winter grounds on the coast of Veracruz, but recent changes in the available food supply have reduced its numbers there. It is also common in the Tampico lagoons, and to a lesser extent in the Papaloapan delta. Small numbers were observed in most of the other coastal marshes and freshwater lagoons." (Saunders).

Pintail, *Anas acuta*.—"Common to abundant in winter and migrations, chiefly in coastal waterfowl areas." (Saunders).

Green-winged Teal, *Anas carolinensis*.—"Common in winter, especially in the Tampico section and in the Papaloapan delta." (Saunders).

Blue-winged Teal, *Anas discors*.—"Abundant in migrations, common in winter." (Saunders).

Northern Cinnamon Teal, *Anas cyanoptera septentrionalium*.—"Fairly common in winter and migrations, but local. Most often recorded in small lagoons and marshes in the northeastern corner of the state." (Saunders).

Probably also regular in mountains: five Jalapa skins seen (L).

American Widgeon, *Mareca americana*.—"Common in winter and migrations, especially in the vicinity of Tampico, Laguna de Tamiahua, and in the Papaloapan delta. Three banded Baldpates reported from Veracruz." (Saunders).

I have seen an undated Orizaba specimen (G).

Shoveler, *Spatula clypeata*.—"Locally common in winter and migrations." (Saunders).

Remains until at least mid-April (cf. Chapman, 1914: 542).

Redhead, *Aythya americana*.—"Uncommon in winter, but more or less regularly observed in small numbers near Tampico, on Laguna de Tamiahua, and occasionally on Laguna Alvarado. One banded Redhead reported from Veracruz." (Saunders).

Two old undated specimens from Orizaba examined (F).

Ring-necked Duck, *Aythya collaris*.—"Locally common in winter and migrations in the Papaloapan delta. Small numbers observed regularly in the Tampico area. One banded Ring-neck reported from Veracruz." (Saunders).

Wetmore (1943: 236) recorded "about 300" in the Río Papaloapan on March 5 and "about 25" there as late as April 16, 1939. Previously, the only record was that of Sclater (1859a: 369), who recorded a Ring-neck from Jalapa under the name of "*Fuligula affinis*" (cf. Sclater and Salvin, 1876: 400).

Canvasback, *Aythya valisineria*.—"Regular but very local in winter, chiefly on northern coastal lagoons. Formerly Laguna de Tamiahua was a principal wintering ground of this species. In the past several years only small numbers have been observed in Veracruz, chiefly in Laguna de Tamiahua, lagoons near Tampico, and in the Papaloapan—Alvarado sector." (Saunders).

Taken at Laguna de Tamiahua as late as April 21 by Chapman and Fuertes (H, D, respectively).

Lesser Scaup, *Aythya affinis*.—"Abundant and widely distributed in winter and migrations, especially on coastal lagoons. The largest concentrations observed in recent years have been on Laguna de Tamiahua to the south of Isla Juana Ramirez. Very common in the Tampico area and in the Papaloapan delta." (Saunders).

Northern Ruddy Duck, *Oxyura jamaicensis rubida*.—"Regular but local in winter and migrations. Recorded each winter in the Tampico area, and usually small numbers were present on Laguna de Tamiahua and in the Papaloapan delta. A few remain all summer, according to local informants in the Tampico area." (Saunders).

There is an old September record for Jalapa (Ferrari-Perez, 1886: 174).

\*Hooded Merganser, *Lophodytes cucullatus*.—Probably rare or casual in winter; only two records: Jalapa (Sclater, 1859a: 369) and Orizaba (Sumichrast, 1881: 234).

\*(Northern) Swallow-tailed Kite, *Elanoides forficatus (forficatus)*.—Rare or casual transient; one record: two (presumably of nominate race) seen by Chapman (1898: 35) at Jalapa, March 29, 1897.

Mississippi Kite, *Ictinia mississippiensis*.—Little known, but probably a regular transient. Credited to Veracruz by Friedmann, Griscom, and Moore (1950: 50). I noted a flock of five at Jalapa, May 4, 1939, circling north quite near, so that color, including unmarked tail, shape, size, and manner of flight were all well seen. Davis and Morony (1953b: 360) record this kite from near Nanchital in April.

Northern Sharp-shinned Hawk, *Accipiter striatus velox*.—Regular, widespread, and not rare in winter. I have examined undated old skins of this race from Jalapa (F) and Orizaba (F). Wetmore (1943: 238) shot one near Tres Zapotes on April 7.

Cooper's Hawk, *Accipiter cooperii*.—Fairly common winter visitant, at least in central Veracruz. Seen as late as April 23 at Jalapa.

Western Red-tailed Hawk, *Buteo jamaicensis calurus*.—The species is not uncommon in winter in most parts of Veracruz. Specimens examined from Pánuco, March 2 (H) and Orizaba, November (F) are richly colored and best referred to *calurus*. Some form of *B. jamaicensis* nests at high altitudes. Presumably this would be *costaricensis*, but a male having the "testes minute" from the northern slope of Cofre de Perote at 10,500 feet, July 27, has been identified as *calurus* by Van Tyne (cf. Davis, 1945: 274), and also by J. W. Aldrich (T).

\*Texas Red-shouldered Hawk, *Buteo lineatus texanus*.—Rare or casual in winter. Recorded from Orizaba (Sclater, 1857a: 211, and Sclater and Salvin, 1869: 364). A young male, presumably of the subspecies *texanus*, which is the only form credited to Veracruz by Friedmann, Griscom, and Moore (1950: 55), was received by the U. S. National Museum a few years ago. It was taken in "Vera Cruz" by A. E. Colburn, December 31, 1900, on which date Colburn was in southwestern Veracruz.

Northern Broad-winged Hawk, *Buteo platypterus platypterus*.—Fairly common transient nearly throughout; probably winters regularly. I saw two at Jesús Caranza on March 19, and two at Las Vigas migrating with Swainson's Hawks on April 5 (latest spring date).

Swainson's Hawk, *Buteo swainsoni*.—Abundant transient in April. I noted 200 or more near Las Vigas on April 5, no less than 4200 near Jalapa on April 18, and two at Jalapa on April 23 (latest spring date). Two undated Orizaba skins examined (F). As yet, no fall or winter records.

\*Bald Eagle, *Haliaeetus leucocephalus*.—Status uncertain; probably a rare winter visitant. Added to the state list by Dr. George B. Saunders, who writes (*in litt.*): "Recorded on January 20, 1939, near the village of Tamiahua and on January 23, 1947, at the northern end of Laguna Alvarado."

American Marsh Hawk, *Circus cyaneus hudsonius*.—Common and well distributed from September until spring. Latest date May 11 (seen over marshes near city of Veracruz).

American Osprey, *Pandion haliaetus carolinensis*.—Fairly common coastwise, at least from July 1 (one closely observed at Tamós) until May 30 at Alvarado (F). No evidence of nesting.

\*Prairie Falcon, *Falco mexicanus*.—Status uncertain. One sight record: a large pale falcon with contrasting blackish axillars dashed about thirty feet over my head on July 20, 1952, just outside of Limón.

\*Peregrine Falcon, *Falco peregrinus anatum*.—Only two records, but doubtless regular in small numbers, chiefly coastwise. The only Veracruz specimen was taken by Forbes at Palma Sola on November 15, 1937 (Lowery and Dalquest, 1951: 557). I observed an adult, quite close, flying along the beach at Veracruz, March 1, 1939.

Eastern Pigeon Hawk, *Falco columbarius columbarius*.—Less than ten records for the species, but it is probably regular and not uncommon on migration and in winter. The nominate race is apparently the only one to have been taken in Veracruz so far. Single birds (subspecies ?) were noted by me near Las Vigas on April 8 and Jalapa on April 13.

Northern Sparrow Hawk, *Falco sparverius sparverius*.—Common in winter and on migration throughout. Recorded "up to the summit of [Mount] Orizaba" (Stone, 1890: 214), but most numerous in lowlands. Summers locally and probably breeds in high mountains. I have seen single individuals near Perote on May 26 and June 27, 1939, and on July 20 and 21, 1952. Davis (1945: 274) has recorded a male with small testes taken at 10,500 feet on Cofre de Perote, July 30, Through Dr. Davis' courtesy, I examined this bird (wing 175 mm., tail 113), together with four taken on August 11 and 12 on the west slope (10,000 feet) of Mount Orizaba in Puebla, and agree with Dr. Van Tyne that they are nearer *sparverius* than *tropicalis*. Because of the dates and the somewhat intermediate characters of these specimens, it seems probable that the Sparrow Hawk breeds near Perote and on Mount Orizaba.

I know of no evidence of breeding in the lowlands other than the belief of Dr. Wetmore's native assistant that they nest in holes in palms (Wetmore, 1943: 243).

\*Little Sparrow Hawk, *Falco sparverius paulus*.—Probably a casual winter visitant;

one record: a male collected near Jalapa, October 19, 1946 (Lowery and Dalquest, 1951: 557).

\*Northern King Rail, *Rallus elegans elegans*.—Perhaps only casual; one record: Tlacotalpam (Ridgway and Friedmann, 1941: 85).

\*Northern Virginia Rail, *Rallus limicola limicola*.—Probably a regular winter visitant, but as yet known only from a Potrero Viejo, November 26, female (Lowery and Dalquest, 1951: 562), and four specimens taken by Chapman (1898: 36) at two marshes near Jalapa in the spring of 1897. I recently examined these Jalapa skins (H) and was unable to distinguish them from spring examples from the eastern United States.

\*Sora, *Porzana carolina*.—Few records, but doubtless regular and fairly common. Recorded from Orizaba (Sumichrast, 1881: 229); Tlacotalpam, February 29 (Wetmore, 1943: 247); and from near Potrero Viejo, October 26 (Lowery and Dalquest, 1951: 563). It has also been taken at Jalapa (L) and Laguna de Tamiahua, April 24, 1904 (G).

\*Florida Common Gallinule, *Gallinula chloropus cachinnans*.—Perhaps a local resident in suitable areas, but as yet known only from my observation of four individuals of this species near Isla on March 13 and 14, 1939.

\*Eastern American Oyster-catcher, *Haematopus palliatus palliatus*.—Presumably regular along northern coast, where it may breed. A male collected about 75 miles south of Tampico on the Gulf side of Laguna de Tamiahua, April 23, 1904 (G) is probably the basis for the Veracruz reference in Friedmann, Griscom, and Moore (1950: 89).

\*Semipalmated Ringed Plover, *Charadrius hiaticula semipalmatus*.—Common transient and winter visitant coastwise, but as yet sight records only. Dr. Robert W. Storer kindly informs me that he saw this species at Boca del Río on August 1, 1941. Noted by me at Veracruz: about 20 on August 7, 30 on August 9, 20 on February 28, 8 on March 1, and 16 on March 30; I also saw one at Puerto México on August 26.

Wilson's Thick-billed Plover, *Charadrius wilsonia wilsonia*.—A male taken by R. B. Lea on May 30, 1947, near Tamós had one testis greatly enlarged and two very distinct and one indistinct brood-patches (C). I saw four in this same area on June 30, 1952, and suspect it may breed there. The species is fairly common at the city of Veracruz, where I have never failed to find it during the summer, winter, or spring, though without obtaining evidence of breeding.

\*Belding's Thick-billed Plover, *Charadrius wilsonia beldingi*.—Probably accidental; one record from "Tacolutla" (=Tecolutla), August 27, Friedmann, Griscom, and Moore, 1950: 92).

Northern Killdeer, *Charadrius vociferus vociferus*.—Fairly common winter visitant until April 1 in open country nearly everywhere up to at least 9000 feet.

\*Atlantic American Golden Plover, *Pluvialis dominica dominica*.—Presumably a regular but uncommon spring transient. Specimens taken at Jalapa on an unknown date (Selater, 1859a: 369) and on March 21 (Friedmann, Griscom, and Moore, 1950: 90). At Isla I saw and heard three on March 14 and one on March 27. Davis (1952b: 324) saw this species in April near Boca del Río.

Black-bellied Plover, *Squatarola squatarola*.—Common along coast in winter and on migration. Noted by me at Veracruz: 10 on August 7, 7 on August 9, 29 on February 28, 7 on March 1, 3 on March 30, and 5 on May 10.

\*American Ruddy Turnstone, *Arenaria interpres morinella*.—Common along the coast on migration and in winter, though known from sight records only. Near the city of Veracruz I counted 9 on August 7, 1 on August 9, 46 on February 28, 5 on



March 1, 14 on March 30, and 5 on May 10. Dr. George B. Saunders writes me that he has observed this species in autumn and winter near the city of Veracruz and near Alvarado.

Wilson's Common Snipe, *Capella gallinago delicata*.—Fairly common in passage and in winter, though representative migration dates are lacking. Noted by me only at Isla: a single bird on March 14. Undated Orizaba skin seen (F).

Long-billed Curlew, *Numenius americanus (americanus)*.—I have not attempted subspecific identification of specimens examined, but only the nominate race is credited to Veracruz by Oberholser (1918a: 191) and by Friedmann, Griscom, and Moore (1950: 94). Non-breeding birds are fairly common at all seasons in suitable areas. Flock of 39 seen near Tamós as early as June 30. Uncommon in mountains, as at Coatepec and Jalapa (two without dates, F).

\*Hudsonian Whimbrel, *Numenius phaeopus hudsonicus*.—Added to the state list by Dr. George B. Saunders, who writes (*in litt.*): "Regular spring transient along the coast. Recorded several times on laguna flats near Tamós during April and May. One was seen in the possession of a local hunter at Cacalilao on April 28, 1949."

Upland Plover, *Bartramia longicauda*.—Probably a regular, widespread transient, at least in spring. However, the only recent records known to me are those of Wetmore (1943: 249) and Davis (1952b: 324). I have seen old undated specimens from Mirador (G) and Jalapa (F). An apparently unpublished Tamaulipas record is one taken by Gillin at Tampico on April 1, 1923 (P).

Spotted Sandpiper, *Actitis macularia*.—Common between sea-level and 4000 feet from July 19 (Warner and Mengel, 1951: 291) until May 24 (Lowery and Dalquest, 1951: 564). Undoubtedly occurs up to 8000 feet or more, for I noted two on July 20 at Lago de Alchichica, Puebla.

\*Eastern Solitary Sandpiper, *Tringa solitaria solitaria*.—Probably common on migration and perhaps in winter, but the only critically determined Veracruz specimen known to me is the female from Tres Zapotes taken March 29 and recorded by Wetmore (1943: 250).

Western Solitary Sandpiper, *Tringa solitaria cinnamomea*.—Common on migration and perhaps in winter up to at least 4000 feet. Critically determined specimens are from Orizaba (F; G; both undated); Mirador, October, 1863 (G); and Tres Zapotes, March 29 (Wetmore, 1943: 250). The species was noted by me as early as August 4 near Presidio, and as late at May 11 near city of Veracruz.

\*Western Willet, *Catoptrophorus semipalmatus inornatus*.—A male taken by Fuertes on April 20, 1910, at Lago de Tamiagua is *inornatus* (D). This is apparently the only critically determined Veracruz specimen of the Willet, though *inornatus* was taken at nearby Tampico, April 11, 1904 (G). The old record for the vicinity of Orizaba (see Slater, 1860: 253) probably belongs to this race also. The species was noted by me at Tamós on June 30 (one), at Veracruz on August 1 (one) and August 7 (three), and at Puerto México on August 26 (two).

Greater Yellowlegs, *Tringa melanoleucus*.—Common on migration and in winter, coastwise and inland. To be expected every month of the year. Recorded by Wetmore (1943: 250) and Brodtkorb (1943: 37). Taken at Mirador (G), and at Potrero on March 19 (H). Noted by me in small numbers at Isla in March, at Veracruz on May 10, and at Tamós on June 30 and July 1.

Lesser Yellowlegs, *Tringa flavipes*.—Common to abundant on migration and in winter, coastwise and inland. Recorded recently by Wetmore (1943: 250) and Brodtkorb (1943: 37), and long ago by Slater (1859b: 393) from Playa Vicente in April. Plentiful at Isla in March, and a few noted at Veracruz on various dates between August 7 and May 10.

\*American Knot, *Calidris canutus rufa*.—Perhaps regular along coast in winter, but as yet only one record: from 25 miles south of Rivera, April 13, 1904 (G).

Pectoral Sandpiper, *Erolia melanotos*.—Regular but uncommon transient coastwise and inland. An apparently unrecorded specimen is a female from Isla de los Pájaros, April 24, 1904 (G). I noted three at Isla on March 14 and one at a mudhole a few miles inland from the city of Veracruz on May 11 (latest spring date).

\*White-rumped Sandpiper, *Erolia fuscicollis*.—Probably an uncommon to rare transient; but so far one sight-record only: one very closely seen both at rest and in rump-displaying flight while uttering its diagnostic call on the beach at Veracruz, May 10, 1939.

\*Baird's Sandpiper, *Erolia bairdii*.—Probably a regular spring and fall transient both coastwise and inland up to very high altitudes. Old records are from Jalapa and "Las Vegas" [=Las Vigas] (see Sharpe, 1896: 570). A loose flock of six was closely observed and heard at Veracruz on August 7, 1937.

Least Sandpiper, *Erolia minutilla*.—Common in migrations and winter along coast, less so inland. Recorded between July 18 at Boca del Río (T) and May 25 at Potrero Viejo (E). I noted small flocks at Veracruz in August, February, and March, at Puerto México in August, at Isla in March, and at Jesús Carranza in March.

\*Long-billed Dowitcher, *Limnodromus scolopaceus*.—Locally abundant in migrations and winter, coastwise and at favorable localities inland. In October, 1863, Sartorius took a female at or near Mirador (G). Dalquest took five March 20 to 21 near Jesús Carranza, and noted "flocks of hundreds . . . along the Río Coatzacoalcos in April" (Lowery and Dalquest, 1951: 564). I saw a few dowitchers, thought to be *scolopaceus*, at Veracruz in August and at Isla in March. G. B. Saunders informs me (*in litt.*) that he has seen dowitchers in winter near Veracruz, Alvarado, and Laguna Pueblo Viejo.

\*Stilt Sandpiper, *Micropalama himantopus*.—Presumably a regular transient, but as yet one sight record only: a flock of eight with Lesser Yellowlegs seen by me at Isla, March 14, 1939.

\*Semipalmated Sandpiper, *Ereunetes pusillus*.—Previously unrecorded, but probably regular along coast on migration and in winter. G. B. Saunders kindly informs me that he took one "near Tamós, September 27, 1939." I closely observed small flocks, confidently thought to be *pusillus*, at Veracruz on August 7 and 9, 1937, and August 1, 1952.

Western Sandpiper, *Ereunetes mauri*.—Fairly common on migration and in winter along coast; less common inland. Credited to Veracruz by Friedmann, Griscom, and Moore (1950: 99). I saw a few *Ereunetes*, thought to be *mauri*, at Veracruz in February, March, and early August; also at Puerto México on August 26 and at Isla on March 13.

Sanderling, *Crocethia alba*.—Common in winter and on migration along the coast; rare or casual inland: old records for Misantla and Jalapa cited by Salvin and Godman (1904: 386). I saw small numbers at Veracruz between August 1 and May 10, and at Puerto México on August 26.

\*American Avocet, *Recurvirostra americana*.—Apparently a rare winter visitant coastwise and inland; three records, all undated: Alvarado and Córdoba (Sumichrast, 1881: 233), and Mirador (G).

\*Wilson's Phalarope, *Slegonopus tricolor*.—Probably a rare transient. The only record known to me is that of Schlegel (1864: 60) from "Vera Cruz."

American Herring Gull, *Larus argentatus smithsonianus*.—Common to abundant winter visitant along entire coast, August to May; uncommon to rare inland. I have



seen as many as 90 in one winter day at Veracruz harbor. Latest spring record May 10 at Veracruz. Cooke (1940: 250) has called attention to the number of returns of banded Herring Gulls from the Veracruz coast south to Puerto México and Tabasco, also an inland recovery from Coscomatepec.

\*California Gull, *Larus californicus*.—Rare or casual winter visitant; one old record from Alvarado (Ferrari-Perez, 1886: 179).

\*Ring-billed Gull, *Larus delawarensis*.—Regular and rather common locally, present nearly throughout the year. Recorded from Laguna Cerro Pez by Lowery and Dalquest (1951: 565). I saw two immature birds near Tamós on July 1, 1952, and one the next day along the coast about sixty miles south of Tampico. Dr. G. B. Saunders writes me that he has recorded it commonly in winter south of Tampico in state of Veracruz.

\*Western Black-headed Gull, *Larus ridibundus ridibundus*.—Accidental; one record as detailed by Friedmann, Griscom, and Moore (1950: 106), and previously recorded by Oberholser (1923: 438) and Lincoln (1925: 374).

Laughing Gull, *Larus atricilla*.—Locally common along the coast all year. Occurs regularly inland as far as Tlacotalpam (Wetmore, 1943: 251) and Minatitlán (Brodkorb, 1943: 38), and casually (?) to Jalapa (Ferrari-Perez, 1886: 179). No evidence of breeding, though apparently commoner, or perhaps just more widespread, in summer than in winter. Seen in June and July a short distance south of Tampico.

\*Franklin's Gull, *Larus pipixcan*.—Probably a regular coastal and inland transient, though not noticed until May 10, 1939, when I collected a male and female at Veracruz. Two others were seen at Alvarado on May 12. Dr. Robert W. Storer writes me that he saw "two adults in very ragged plumage, apparently non-breeding birds," near Boca del Río, August 1, 1941. Davis and Morony (1953b: 360) saw one or more near Nanchital in April.

\*Bonaparte's Gull, *Larus philadelphia*.—Probably regular, but so far the only record is that of Evenden (1952: 113): "One was flying over, and resting on, the waters of the Gulf of Mexico, off the end of the Río Panuco jetty, Tampico (Madera), Tamaulipas, March 1, 1951." Since the Río Panuco at this point delimits Veracruz and Tamaulipas, this record applies equally to both states.

\*Eastern Gull-billed Tern, *Gelochelidon nilotica aranea*.—Probably regular on migration and in winter coastwise, at least in northern Veracruz, where it may breed. So far only one or two records. Friedmann, Griscom, and Moore (1950: 107) specify Pajaros Island, April 25, 1904, whereas I have examined a male (G) taken by Piper, Sheldon, and Sanford on the same date at "Isla de los Frijoles." Presumably these are one and the same. A previously unreported specimen from extreme southern Tamaulipas is a female shot by T. S. Gillin at Tampico, October 28, 1923 (P).

\*Forster's Tern, *Sterna forsteri*.—Probably a regular winter visitant, possibly breeding in northern Veracruz. A female of "litoricola" (ovary greatly enlarged, wing 247 mm., tail 140, culmen 37) was taken by Lea at a "swamp along Valles Road, 7 mi. W. of Tampico" on May 30, 1947 (C). In this same area on July 1, 1952, I saw and heard at least twenty Forster's Terns, nearly all of which were in non-breeding plumage. I have also seen two undated mounted birds from Pueblo Viejo (L).

Northern Common Tern, *Sterna hirundo hirundo*.—Probably regular on migration and in winter. Four were taken at Minatitlán, April 25 and 26 (Brodkorb, 1943: 38); Friedmann, Griscom, and Moore (1950: 108) mention April and May 30 occurrences; and Campbell (1940: 89) records one banded near Toledo, Ohio, on July 12, 1930, which was recovered on October 31, 1930, at Puerto México. Robert W. Storer writes me that he carefully "looked over a large number on the beach" at Boca del

Río on August 1, 1941. I saw at least two at Tamós on July 1, 1952, this being very close to where Gillin collected a male, June 12, 1923 (P).

\*Eastern Least Tern, *Sterna albifrons antillarum*.—Status uncertain; possibly breeds. The only Veracruz specimen known to me is the male from Boca del Río recorded by Warner and Mengel (1951: 291). It has only two dusky outer primaries and the bill is black-tipped (C). The species was noted by me at Veracruz: 2 on August 7 and 1 on May 10; also, just north of the state line, on June 26, 1952, when 15 were seen at Tampico (Miramar). Dr. R. W. Storer noted some near the city of Veracruz on July 31 and August 1, 1941 (*in litt.*), and G. B. Saunders writes me that he has seen it on numerous late winter and early spring trips south of Tampico.

American Royal Tern, *Thalasseus maximus maximus*.—Fairly common along entire coast throughout the year; may breed. Casual at Jalapa (Ferrari-Perez, 1886: 179).

\*\*Cabot's Sandwich Tern, *Thalasseus sandvicensis acuflavids*.—Present in small numbers along coast during most of year. Saunders (1896: 75) lists specimens from Laguna Verde and La Antigua, while Friedmann, Griscom, and Moore (1950: 111) have "Veracruz (winter records)." I saw up to twenty a day at Veracruz in early August, 1937. R. W. Storer writes me that he observed the species at Boca del Río on August 1, 1941.

\*Caspian Tern, *Hydroprogne caspia*.—Apparently rare, but probably a regular winter visitant coastwise. Recorded from Laguna Cerro Pez by Lowery and Dalquest (1951: 565). Dr. George B. Saunders writes (*in litt.*): "Recorded in winter near Tampico in state of Veracruz."

American Black Tern, *Chlidonias niger surinamensis*.—Common coastal transient, at least when southbound. Appears as early as July 1 (two closely observed at Tamós). I have seen up to fifty a day at Veracruz in August, but have no spring record. To be expected far inland.

\*Northern Black Skimmer, *Rynchops nigra nigra*.—Status uncertain; may breed locally, but so far only two specimens: a male taken at Lago de Tamiahua, April 20, 1910 (D), and an immature, able to fly, collected at Alvarado, date unknown (L). G. B. Saunders writes (*in litt.*): "Recorded in winter south of Tampico in Veracruz."

Eastern Mourning Dove, *Zenaidura macroura carolinensis*.—Widespread and fairly common on migration and in winter. There is unquestionably a late spring passage of *carolinensis* along the coastal plain. Brodtkorb (1943: 38) lists April 24 and 26 specimens from Minatitlán. Wetmore (1943: 252) states that Carriker did not find the species until May 1, but on May 2 "a typical specimen of the eastern form" was secured.

Western Mourning Dove, *Zenaidura macroura marginella*.—Fairly common transient and winter visitant from sea-level to at least 9000 feet; may breed in mountains and perhaps in northern lowlands. Traylor shot a female, ovary enlarged, at 8500 feet near Perote, September 3, 1948 (N). I noted a few singing Mourning Doves (race?) at Jalapa in late April, but none there or at Las Vigas and Perote in late May, June, July, or August. In extreme northern Veracruz, however, I saw one (race?) at Tamós, July 1, 1952.

Like *carolinensis*, *marginella* is represented along the coastal plain by May migrants. I saw none at Veracruz during two March visits, but took a female (wing 147 mm., tail 132, ovary enlarged) from a flock of seven on the beach at Veracruz, May 10. Seven there the next day and six at Alvarado on May 12 may have belonged to either northern race.

\*Passenger Pigeon, *Ectopistes canadensis*.—Formerly wintered south casually to Jalapa and Orizaba (Sanchez, 1878: 104).

Eastern Yellow-billed Cuckoo, *Coccyzus americanus americanus*.—Subspecifically identified Veracruz skins belong to nominate race, but *occidentalis* should also occur. *C. a. americanus* probably breeds in extreme north, Gillin having taken it at Tampico, June 11, 1923 (P), and I found one (race?) in full song at nearby Tamós, June 30, 1952. Farther south, in central Veracruz mountains, absence of June records indicates transient status, though I saw the species as late as May 22 at Córdoba. Occurs in small numbers from sea-level up to 8000 feet or more as a transient, chiefly in May. Returns to central Veracruz in August. As yet, no winter record.

\*Black-billed Cuckoo, *Coccyzus erythrophthalmus*.—Probably an uncommon but regular transient. Recorded from Orizaba by Sclater (1857a: 214 and 1860: 252) and by Sumichrast (1881: 239). I collected one at Jalapa on April 24 (D) and observed another there on May 6, 1939. R. B. Lea took one near Potrero on April 17, 1947 (C). Davis and Morony (1953a: 353) list it as seen near San José del Carmen.

\*Northern Short-eared Owl, *Asio flammeus flammeus*.—Rare or casual winter visitor; one record from vicinity of Orizaba (Sclater, 1857a: 212).

\*Chuck-will's-widow, *Caprimulgus carolinensis*.—Doubtless regular on migration and in winter, but easily overlooked. Four records: the April 9 and April 21 specimens recorded by Wetmore (1943: 261), the August 22 male taken at about 5000 feet, east of Teziutlán, by Traylor (1949: 270–271), and an April sight-record by Davis and Morony (1953b: 360) near Nanchital.

Eastern Whip-poor-will, *Caprimulgus vociferus vociferus*.—Regular in winter and on migration between 1500 and 7000 feet. Old specimens, like one from Orizaba (F) are undated. Friedmann, Griscom, and Moore (1950: 156) list four Veracruz dates. Others are April 1 (male, wing 148 mm.), April 10 (male, wing 150), and April 18 (female, wing 154), all taken by Chapman at Jalapa (H), and December 7 at Motzorongro (Lowery and Dalquest, 1951: 581).

\*Merrill's Pauraque, *Nyctidromus albicollis merrilli*.—Doubtless regular in winter. Critically determined specimens include a male from Presidio, December 2 (Lowery and Dalquest, 1951: 579), a female from Mirador, February 7, 1894 (G), a male from Río Pánuco, April 5, 1942 (P), and the male from Tres Zapotes, March 10 recorded by Wetmore (1943: 260).

\*Howell's Common Nighthawk, *Chordeiles minor howelli*.—Presumably a regular transient; one record: a male (wing 194 mm., tail 113) taken at Pueblo Viejo on May 10, 1923 (P).

\*Cherrie's Common Nighthawk, *Chordeiles minor aserriensis*.—Status uncertain. Warner and Mengel (1951: 292) mention seeing and hearing *Chordeiles minor* every evening during their stay at Boca del Río, July 15 to 21, 1942. The only nighthawk collected there, by R. E. Stone on July 23, is an immature female provisionally identified as *aserriensis* by Dr. Wetmore. When examining this bird in 1950 (T), I obtained the following measurements: wing 177 mm., tail 104. Quite possibly this individual, the only Veracruz *aserriensis* known to me, may have been an early transient, because a female taken on July 5, 1930, from her nest with two eggs on the beach near the city of Veracruz, only about twenty kilometers from Boca del Río, has been identified as *chapmani* by Oberholser, Charles H. Rogers (who collected her), and me (Q). Individual variation being so great in this species, more breeding material from coastal Veracruz is needed. Certainly, as Warner and Mengel (*loc. cit.*) point out, *chapmani* is hardly the nesting form to be expected at Veracruz.

I might add that in 1952 I found no nighthawks at Veracruz during a brief visit from July 30 to August 2, but saw and heard a few in the Tampico region in late June and early July.

\*\*Chimney Swift, *Chaetura pelagica*.—Common transient, at least in spring, from sea-level to an altitude of 4500 feet or more. Veracruz specimens, in addition to those mentioned by Friedmann, Griscom, and Moore (1950: 158), are from near Potrero, April 16 (C), from near Jesús Carranza, April 10 (Lowery and Dalquest, 1951: 581), and from Pueblo Viejo, April 5, when George F. Breninger noted swifts "crossing the lagoon all day, going north." (See Lincoln, 1944: 605.)

The Chimney Swift's twittering notes are sufficiently different from those of *vauxi* (including *richmondi* and, presumably, *tamaulipensis*) that I feel quite confident most if not all of the following *Chaeturae* were *pelagica*. In each case they were calling as they moved steadily northward at no great distance from me, their size and color seemingly just right for Chimney Swifts. At Coatepec: about 90 on April 11, 13 on April 17, and 13 on May 5; at Jalapa: 10 on April 13, about 220 on April 23, 20 on April 29, 5 on May 1, 20 on May 3, 7 on May 6, 5 on May 8; at Veracruz: 15 on May 11; at Alvarado: 13 on May 12.

L. Irby Davis (1952a: 315) noted some near Catemaco in April.

\*Northern Vaux's Swift, *Chaetura vauxi vauxi*.—Status uncertain. Credited to Veracruz by Friedmann, Griscom, and Moore (1950: 159). The only specimen known to me is a male taken by Nelson and Goldman at Motzorongo, February 25, 1894 (G). Sumichrast (1881: 250) lists this swift for Río Seco near Córdoba, but may have mistaken it for another *Chaetura*.

Ruby-throated Hummingbird, *Archilochus colubris*.—Rather common nearly throughout in winter and on migration, from September 6 (a male from just north of the line at Tampico; P) until May 5 (male from Catemaco; G).

\*Black-chinned Hummingbird, *Archilochus alexandri*.—Perhaps regular in winter in the high mountains, but so far just one record: a female from Las Vigas, April 2 (Sutton and Burleigh, 1940a: 238).

\*\*Rufous Hummingbird, *Selasphorus rufus*.—Probably rare or casual in winter, found only by Sartorius at Mirador (Ridgway, 1911: 613).

Eastern Belted Kingfisher, *Megaceryle alcyon alcyon*.—Locally not uncommon in winter and on migrations up to 4500 feet or more. Remains until at least March 29.

Eastern Yellow-bellied Sapsucker, *Sphyrapicus varius varius*.—Fairly common winter visitant until April 16 (Jalapa; H). Nearly all records are from between 4000 and 8000 feet, an exception being an April 11 female from Pueblo Viejo near sea-level (N).

\*Eastern Kingbird, *Tyrannus tyrannus*.—Generally overlooked, but doubtless a regular transient along coastal plain, at least in August. Sumichrast (1869: 557) considered it quite rare but had seen lowland specimens. Sclater (1859b: 383) recorded it from Playa Vicente in May. These seem to be the only records prior to 1937, when I noted one at Veracruz on August 8, one at Jesús Carranza on August 25, and four at Puerto México on August 26. Davis and Morony (1953b: 360) list an April record from near Nanchital.

\*\*Northern Cassin's Kingbird, *Tyrannus vociferans vociferans*.—A little known winter visitant in the mountains, recorded only from Orizaba (undated skins; F; G) and Mirador (Ridgway, 1907: 696). It probably reaches Veracruz by late July, since there is a July 22 specimen (T) from near Tlaxcala, 7500 feet, state of Tlaxcala. Sumichrast (1869: 557) confused this species with the abundant *T. melancholicus*.

Scissor-tailed Flycatcher, *Muscivora forficata*.—Common transient, late March to mid-May and again in October, chiefly along coastal plain, more rarely in highlands: one Orizaba specimen (F), and seen by Stone (1890: 214) near Chalchicomula, Puebla, 8200 feet. Probably winters rarely and locally: a December 17 male re-

corded by Lowery and Dalquest (1951: 607). Earliest dated spring specimen March 19 (H), though in February Carriker saw what was probably a wintering pair near El Conejo, where on May 15 he shot a female, the latest spring record for the state (Wetmore, 1943: 285). I found Scissor-tails still common at Veracruz on May 11.

\*Northern Great-crested Flycatcher, *Myiarchus crinitus boreus*.—The only critically determined Veracruz specimens of this race are a female I took at Jalapa on April 25, 1939 (D), and a May 7 specimen obtained by Carriker on Cerro de Tuxtla (Wetmore, 1943: 289). Either this or the nominate race was observed daily by Dr. Wetmore (*loc. cit.*), March 19 to 22, while I noted the species as follows: single individuals at Veracruz on February 28 and March 1, and at Jalapa on April 29. Two mounted, undated specimens (race?) from Orizaba seen (L). Davis (1952a: 315) recorded the species in April, seven miles south of Catemaco, and Davis and Morony (1953a: 353 and 1953b: 360) saw the species near San José del Carmen and Nanchital, respectively.

\*Southern Great-crested Flycatcher, *Myiarchus crinitus crinitus*.—The only definite Veracruz records for this form are the males taken by Brown at Motzorongo on February 9 and 22 (Bangs and Peters, 1927: 478). The species is probably an uncommon winter visitant and transient.

\*Northern Ash-throated Flycatcher, *Myiarchus cinerascens cinerascens*.—Uncommon winter visitant nearly throughout, doubtless usually overlooked because of its resemblance to the common resident *M. tuberculifer*. Dated specimens known to me are February 10 at El Conejo (Wetmore, 1943: 289), February 14 at Chichicaxtle (G), and March 6 at Corral Falso (Brodkorb, 1948: 35). It has also been taken at Mirador, Papantla, Playa Vicente, and Orizaba, as cited by Ridgway (1907: 626).

Eastern Phoebe, *Sayornis phoebe*.—Fairly common winter visitant, as yet unrecorded in Veracruz above 4500 feet. Latest date for northern Veracruz is March 18 at Río Pánuco (P), for central, March 15 at Antigua (F).

Southern Say's Phoebe, *Sayornis saya saya*.—Rather common winter visitant in highlands. The July 30 male taken by T. Moore at Guadalupe Victoria, 8300 feet, had small testes and was probably an early migrant, as suggested by Davis (1945: 277). Dalquest found it "common on the desert near Limón and Perote in October and November" (Lowery and Dalquest, 1951: 606). Latest seen by me was near Las Vigas on April 8.

Yellow-bellied Flycatcher, *Empidonax flaviventris*.—Decidedly common on migration up to at least 5000 feet; regular winter visitant, at least below 2000 feet. Extreme dates are August 14 and May 28. Traylor collected no less than eight east of Teziutlán (4000–5000 feet) between August 19 and 26, 1948 (N). I took specimens at Paraje Nuevo on August 14 and 16, 1937, and Sartorius one at Mirador, August 20 (G). Most individuals pass farther south, but winter records include January 25 at Jesús Carranza (G), February 3 at Presidio (F), and February 23 at Motzorongo (G). In the spring of 1939, I saw nothing that could possibly be *flaviventris* until May 5, but almost daily from then until May 18 one or two yellowish *Empidonaces* thought to be this species were seen and often heard calling. Confirmatory specimens secured on May 8 at Jalapa and May 15 at Córdoba. Lowery and Dalquest (1951: 610) record skins from Fortín May 25 and Jalapa May 28, this last date having been equalled many years before by Nelson and Goldman at Tlacotalpam (G).

\*Acadian Flycatcher, *Empidonax virescens*.—Apparently a rare transient; only one satisfactory record: a female from Jalapa, taken by Nelson and Goldman, May 10, 1901 (G).

\*Little Traill's Flycatcher, *Empidonax traillii brewsteri*.—Status uncertain; one

record: a male (testes somewhat enlarged, wing 70 mm., tail 59; E) taken by Newman at Jalapa on May 27, 1949 (Lowery and Dalquest, 1951: 611).

**\*\*Alder Traill's Flycatcher, *Empidonax traillii traillii*.**—Doubtless a regular spring and fall transient in limited numbers. Critically determined specimens include a May 15 male from El Conejo (Wetmore, 1943: 290) and two skins taken by Traylor east of Teziutlán, August 19 and 27 (N). The species (race?) was seen and heard calling by me at Coatepec, May 5, 1939.

Ridgway (1907: 558) apparently thought that the *Empidonax pusillus* said by Sumichrast (1869: 557) to be "quite common around Orizaba in . . . June and July" was *E. traillii*. Probably Sumichrast's bird was *E. albigularis*, which he failed to list even though it is a rather common breeder at Orizaba.

Salvin and Godman (1897: 71) report *E. traillii* (race?) taken at or in Vera Cruz by Richardson.

**Least Flycatcher, *Empidonax minimus*.**—Common on migration and in winter nearly throughout, though as yet unrecorded in Veracruz above 5000 feet. Earliest dates are August 3 and 4 (Traylor at Ojochico near Córdoba; N). Winter records, too numerous to list, are all from below 2000 feet. Common well into May, occasionally singing (as at Jalapa, May 4). Taken by me at Jesús Carranza on August 23, at Jalapa on May 1, at Veracruz on May 10, and at Córdoba on May 14 and 17 (latest spring date for state).

**Hammond's Flycatcher, *Empidonax hammondi*.**—Fairly common in winter and on migration, though unrecorded below 3500 feet. Extreme dates are September 5 (two taken at Las Vigas by Traylor; N) and April 26 (Las Vigas, Isham; H). I have examined a "June 1864" Sartorius specimen from the "high pines" above Mirador (G), either misdated or representing a non-breeding straggler. Other localities are Orizaba, January 1 (F; G), Coscomatepec, March 7 and 8 (H), and Jalapa, March 20 (Moore, 1940: 355). Taken by me only at Las Vigas on April 10 (D).

**\*Wright's Flycatcher, *Empidonax oberholseri*.**—Apparently a rare winter visitor; only one satisfactory record: Orizaba, January 26, 1894 (G). Sumichrast (1869: 557) lists it for the state, without definite data.

**Eastern Wood Pewee, *Contopus virens*.**—Fairly common transient, chiefly in the mountains, from April 10 (Potrero; H) to mid-May, and again from mid-August (I took one at Orizaba, August 13). Isham collected two at Jalapa in mid-April (F), and Nelson and Goldman one there on May 10 (G). Pewees singing typical *virens* songs noted at Orizaba on August 15; at Jalapa on April 13 and 29, May 4 (taken), and May 8 (two); at Coatepec on April 17 (two); at Xico on May 7; at Veracruz on May 10 (six) and May 11 (four); at Córdoba on May 19 (two).

**Western Wood Pewee, *Contopus richardsonii richardsonii*.**—Presumably a regular transient, though critically determined specimens are few. I have examined a male (wing 83 mm., tail 63, culmen 13, testes not enlarged) from near Potrero, April 14 (C).

**Olive-sided Flycatcher, *Nuttallornis borealis*.**—Quite common transient throughout, though partial to highlands. One winter record: a male from Potrero Viejo, January 23 (Lowery and Dalquest, 1951: 610). On April 4, at about 9800 feet Sutton took a male which is the earliest spring, as well as the highest, Veracruz specimen (Sutton and Burleigh, 1940a: 239). Most numerous from late April to May 19. Southbound, it has been collected in Veracruz, at about 5000 feet, east of Teziutlán, as early as August 19 (Traylor; N). Noted by me at Paraje Nuevo on August 16, at Jesús Carranza on August 21, at Jalapa on May 6 and 8 (three, separately), at Xico on May 7 (two), and at Córdoba on May 22 (latest spring date).

**\*Northwestern Vermilion Flycatcher, *Pyrocephalus rubinus flammeus*.**—Status un-



certain. Two males from Tejería, March 9 and 13, 1941, have been recorded by Brodkorb (1948: 35) as belonging to this race.

Tree Swallow, *Iridoprocne bicolor*.—Locally abundant in winter and on migration chiefly below 5000 feet, remaining at least until late March. Baird (1866: 298) lists two specimens reputedly taken by Sartorius in the "Pine region above Mirador, Mex." during June, 1864.

\*Common Bank Swallow, *Riparia riparia*.—Probably a regular transient in small numbers, but as yet known from only one sight record: twelve in a loose flock of northbound swallows at Jalapa on May 6, 1939. Breast bands and characteristic calls were clearly noted as they circled nearby after I had ineffectually fired my last two shells at them.

Northern Rough-winged Swallow, *Stelgidopteryx ruficollis serripennis*.—Status obscured by other races. A satisfactory specimen of the northern race, which is presumably regular in winter, is a female (wing 98 mm.) from Tlacotalpam, February 7, 1901 (H).

\*Desert Rough-winged Swallow, *Stelgidopteryx ruficollis psammochrous*.—Status uncertain. The only Veracruz specimen known to me is U. S. National Museum No. 352,779 identified as *psammochrous* by Dr. Oberholser in 1937. It is an adult (wing 118 mm., sex and date not on label) taken by Botteri at Orizaba, and distinctly paler above than *serripennis* and *fulvipennis* of comparable antiquity.

American Barn Swallow, *Hirundo rustica erythrogaster*.—As a transient, abundant along coast, common inland up to at least 8500 feet. Said to arrive about mid-February (Dugès, 1899: 357). First noted by me on March 8 at Jesús Carranza; maximum 345 at Veracruz on May 11; still migrating over marshes at Veracruz on May 27. In southward flight first noted at Veracruz on August 7, abundant by August 26 (240 counted at Puerto México in a short time). Date of disappearance not known; nor is there any winter record as yet.

Small numbers summer, and quite likely breed, at high altitudes, as at Perote.

*Petrochelidon* (species?).—Chapman (1898: 27) noted "a species of *Petrochelidon*, whether *lunifrons* or *melanogaster* I cannot say" at Jalapa in the spring of 1897. A few migrating swallows of this genus noted by me on several dates between March 19 at Jesús Carranza and May 26 at Perote, also on August 30 at Atoyac.

For many years it has been erroneously assumed that the Lesser Cliff Swallow, *P. pyrrhonota tachina*, breeds south to the mountains of Veracruz. This assumption is seemingly based almost altogether on the first and, so far as I am aware, only Veracruz specimen of *Petrochelidon*: U. S. National Museum No. 33,572 taken by Sartorius at or near Mirador in August, 1863 (see Baird, 1866: 290). As Hellmayr (1935: 32, footnote) has pointed out, an August specimen of an early migrant like *Petrochelidon* is no evidence whatever of breeding. Neither is the statement of Sumichrast (1869: 547): "*Petrochelidon Swainsonii*. Region of the plateau. This species, peculiar to the plateau, is rarely found within the department." Curiously; this same Mirador specimen was listed by Ridgway (1904: 52) without a question mark not only in the synonymy of *melanogaster*, but of *tachina* as well (*op. cit.*: 51)! What Hellmayr failed to realize is that this Mirador specimen is not *tachina* at all, but *melanogaster*, for its forehead is cinnamon-rufous (G). Its measurements are definitely too large for *minima* van Rossem and Hachisuka, the wing being 108 mm., and the tail 46.

Veracruz, therefore, should be deleted from the breeding range of *tachina*, a form not yet taken in the state even as a transient. Whether or not *melanogaster* nests in Veracruz remains to be determined.

\*Northern Purple Martin, *Progne subis subis*.—Little known, but probably a

regular transient coastwise. Sumichrast (1869: 547) wrote: "Resident in the alpine region to which it seems to confine itself." Apparently on this basis, the A. O. U. Check-List (4th ed., 1931: 219) included Veracruz in its breeding range, but this should be changed, since recent field-workers have failed to find it in the Veracruz mountains. The only Veracruz specimens known to me are four males taken by Nelson and Goldman not far from the coast at Catemaco, May 2 to 4, 1894 (G). At Puerto México on August 26, I noted at least twelve, including several unmistakable adult males.

\*Eastern House Wren, *Troglodytes aëdon aëdon*.—Probably only casual in winter. The sole record is that published by Wetmore (1943: 300) of a male taken January 20 at Tres Zapotes.

Western House Wren, *Troglodytes aëdon parkmanii*.—Common in northern and central Veracruz up to 9000 feet, October 9 to May 6. A February 6 female from Tlacotalpam (H), a March 7 specimen from Paso Nuevo (F), and those from Tres Zapotes (Wetmore, 1943: 300–301) represent the southern limits of this species' known winter range.

\*Prairie Marsh Wren, *Telmatodytes palustris dissaeptus*.—Little known winter visitant, perhaps regular, but easily overlooked. Chapman (1898: 23) collected three at Jalapa, where Isham secured a female on April 15, 1897 (F). Perhaps Sallé's two specimens from Romatlan, recorded by Sclater (1856b: 290) as *Troglodytes palustris* (Wilson), belong here.

Catbird, *Dumetella carolinensis*.—Fairly common in winter and common on migration up to at least 4500 feet. Latest spring date is May 17 (three seen at Córdoba; one singing). Some of the less publicized specimens come from Río Pánuco, February 19 (P); Pánuco, March 19 (H); Papantla, March 6 (G); Misantla, December and January (N); and Achotal, February 27 (N).

\*Eastern Robin, *Turdus migratorius migratorius*.—Apparently only a casual winter visitant, though status obscured by resident highland form, *phillipsi*, which performs a limited vertical migration. Old records of *propinquus* all seem to belong to *phillipsi*. Only records for the nominate race are Tres Zapotes, February 28 (Wetmore, 1943: 303) and Orizaba, no date (Duvall, 1945: 627–628).

\*\*Wood Thrush, *Hylocichla mustelina*.—Regular on migration and in winter, but not common. Old records are from Córdoba (Sclater, 1856b: 294), Jalapa (Sclater, 1859a: 362), and state of Veracruz (Sumichrast, 1869: 543). Wetmore (1943: 305) records three from near Tres Zapotes and two on Cerro de Tuxtla; Bent (1949: 122) specifies "Matzorongo" [=Motzorongo]; and Lowery and Dalquest (1951: 622) list two, April 2 and 3, from southeast of Jesús Carranza. I have seen an undated Orizaba male (F).

Audubon's Hermit Thrush, *Hylocichla guttata auduboni*.—Fairly common winter visitant in mountains down to 4000 feet, rare or casual near sea-level in southern Veracruz, as at Santa Lucrecia, January 24, 1904 (G). Latest date April 25 at Las Vigas (F). Sumichrast (1869: 542), who claimed he "obtained it all seasons," probably did not always distinguish it from the very similar resident, *Catharus occidentalis*. I noted Hermit Thrushes only at Las Vigas (a female of *auduboni* taken on April 4) and Jalapa (one seen on April 13). Chapman took a female at about 9500 feet on Mount Orizaba, March 23 (H).

Russet-backed Swainson's Thrush, *Hylocichla ustulata ustulata*.—Apparently rare but regular in winter and on migration. Three satisfactory records are Tres Zapotes, January 29 (Wetmore, 1943: 305), Potrero, February 25 (R), and Potrero Viejo, May 15 (E), the last two published by Lowery and Dalquest (1951: 623). Probably



some of the old records for "*Turdus swainsonii*" belong here, as presumably does the Misantla bird mentioned by Bent (1949: 172). The species (race?) was seen near Catemaco in April by L. Irby Davis (1952a: 315).

Olive-backed Swainson's Thrush, *Hylocichla ustulata swainsoni* (includes *almae*).—Probably a rare but regular transient. Old records for "*Turdus swainsonii*" may or may not belong here. The only critically determined specimens are Chapman's from Las Vigas (H), Brown's from Presidio, May 6 (Bangs and Peters, 1927: 482), R. B. Lea's from near Potrero, April 19, 1947 (C), and Carriker's from Volcán San Martín, April 16 (Wetmore, 1943: 305).

Azure Common Bluebird, *Sialia sialis fulva*.—Status obscured by resident *guatemalae*, but probably a regular winter visitant in mountains. Critically determined, but undated, specimens in the Museum of Comparative Zoology are No. 12,279 from Jalapa, and No. 31,908 from Orizaba.

\*Tamaulipas Common Bluebird, *Sialia sialis episcopus*.—Status uncertain; one record: a male taken near Jalapa on October 18, 1946 (Lowery and Dalquest, 1951: 623). I obtained the following measurements: wing 98 mm., tail 67 (R), and agree that its size and coloration indicate *episcopus*, though I suspect its being just a small example of the similarly colored resident race, *guatemalae*.

Eastern Blue-gray Gnatcatcher, *Polioptila caerulea caerulea*.—Common winter visitant nearly throughout, though perhaps present at high altitudes only during migrations. Status obscured by resident *deppei*. Many critically determined examples of *caerulea* have been taken from October 1 (Lowery and Dalquest, 1951: 624) to March 29 (G), and from sea level up to 4000 feet (Orizaba; F). Unquestionably occurs far higher, at least on migration. The species was seen near Las Vigas on April 2, 1939. Warner and Mengel (1951: 294) have identified a Boca del Río July 20 "female (?)" as "*caerulea* on the basis of size (wing, 50 mm.) and coloration." In view of the date, the doubtful sexing, the lack of pronounced color differences between *caerulea* and *deppei*, and the more or less intermediate size of their specimen, I consider this identification unsatisfactory.

Eastern Ruby-crowned Kinglet, *Regulus calendula calendula*.—Common winter visitant in highlands up to 10,000 feet, remaining until late April. Unrecorded in Veracruz below, or south of, Córdoba.

American Water Pipit, *Anthus spinoletta rubescens*.—Fairly common winter visitant locally from sea level up to at least 8000 feet. Chapman (1898: 39) saw a few at Las Vigas on April 22 and 25 (latest spring date). P. M. Toro took two (date?) at Orizaba (F), where also obtained by Sumichrast (Baird, 1866: 155). Sallé found it near Córdoba (Sclater, 1856b: 293). Pipits which I felt sure were of this species were closely observed on the beach at Veracruz on February 28 (16) and March 1 (2), and at Isla on March 13 (1). A single pipit, probably of this species, was seen and heard over Las Vigas, April 4.

\*Sprague's Pipit, *Anthus spragueii*.—Status uncertain; one record: a specimen taken by Godman "close to the town of Vera Cruz" (Salvin and Godman, 1889: 236). Quite likely the "*Anthus* . . . ." recorded by Sclater (1856b: 294) from near Córdoba belongs here.

Cedar Waxwing, *Bombcilla cedrorum*.—Common in winter and on migration at medium altitudes (2500 to 5000 feet), comparatively scarce elsewhere, despite the statement of Sumichrast (1869: 548) that it is "found everywhere, and in great abundance in winter." Wetmore (1943), for example, failed to record it near Tres Zapotes. Noted by me at Córdoba: 9 on March 3, 27 on March 5; at Jesús Carranza: 3 on March 7; at Jalapa: 1 on April 13, 15 on April 21, about 75 on April 27, 9 on May 3 and May 6, 2 on May 8 (latest spring record for state).

White-rumped Loggerhead Shrike, *Lanius ludovicianus excubitorides*.—Status obscured by *L. l. mexicanus*, but probably a regular winter visitant in small numbers. Baird (1866: 450) records a February male from Mirador which Ridgway (1904: 246, footnote d) assigns to *excubitorides*. In the Museum of Comparative Zoology are two undated specimens from Orizaba (Nos. 31,638 and 31,918) which in coloration of back and forehead seem definitely referable to *excubitorides* though showing approach toward *mexicanus* in greater amount of black on lateral rectrices.

White-eyed Vireo, *Vireo griseus griseus* (includes *noveboracensis*, as I have not attempted to distinguish between these two forms).—Fairly common in winter and on migration in lowlands, sparingly up to about 4500 feet. One from near Potrero, April 19 (C) constitutes latest spring record.

Rio Grande White-eyed Vireo, *Vireo griseus micrus*.—Certainly winters and probably breeds in northern Veracruz. Known from February, March, and early April specimens from Pánuco (H) south to Antigua (March 15; F). On the label of a female he took at Tampico, June 26, 1923, T. S. Gillin wrote "breeding." For the benefit of future collectors I might add that between June 30 and July 14, 1952, I heard songs unmistakably of the White-eyed Vireo type coming from extremely dense thickets at Tamós and south to Poza Rica, Gutiérrez Zamora, and Papantla, the last-named being the type locality of Nelson's unique *Vireo (griseus ?) perquisitor*, taken on March 12, 1898. *V. perquisitor* is darker above and yellower below than *micrus*, differences perhaps correlated with the pronouncedly more humid conditions at Papantla as compared with the haunts of *micrus* in southern Texas and Tamaulipas. Perhaps, on the other hand, *perquisitor* is merely an individual variant, or it may be a valid race breeding to the west of Papantla (see Sutton and Burleigh, 1940b: 230).

\*Eastern Bell's Vireo, *Vireo bellii bellii*.—Perhaps a rare but regular transient and winter visitant, though so far only two records: Presidio, May 6 (Bangs and Peters, 1927: 483), and one I took at Jalapa, May 8, 1939 (D).

\*Yellow-throated Vireo, *Vireo flavifrons*.—Rare but presumably regular in winter and migrations. Known from four localities: Santecomapam, January (Sclater, 1857b: 227), vicinity of Orizaba (Sclater, 1860: 251), Tres Zapotes, February 24 (Wetmore, 1943: 308), and 16 miles south of Boca del Río in April (Davis, 1952b: 324).

Blue-headed Solitary Vireo, *Vireo solitarius solitarius*.—Common in winter and on migration nearly throughout. Dozens of specimens of the nominate race examined from all parts of Veracruz up to above 8000 feet. Winters at least as high as Orizaba, 4000 feet (January 18 and 26; both G). Latest spring specimen of northern race taken April 28 at Las Vigas (F).

Red-eyed Vireo, *Vireo olivaceus*.—Regular and not uncommon transient from sea level up to at least 4500 feet. Spring dates are between April 19 (near Potrero; C) and May 6 (specimen taken by me at Jalapa) and May 11 (seen at Veracruz, 1939). In fall from August 21 (at 4500 feet, east of Teziutlán; Traylor; N).

\*Philadelphia Vireo, *Vireo philadelphicus*.—Probably a rare but regular transient. As yet only one record: two males from Presidio, May 10 (Bangs and Peters, 1927: 483).

\*Western Warbling Vireo, *Vireo gilvus swainsonii*.—Apparently rare but regular in winter and on migration. The three specimens examined—from Orizaba, January 26 (G), Jalapa, April 18 (H), and Presidio, May 4 (F)—are all *swainsonii* as understood in the A. O. U. Check-List (1931: 279). Before Salvin and Godman described the resident form, *amauronotus*, in 1881, *Vireosylva gilva* had been recorded from southern México—probably Córdoba—by Sclater (1856b: 298), from Córdoba by Sanchez (1878: 100), and listed as "found in winter" and "only migratory" (i.e., not breeding) by Sumichrast (1869: 548).

A Warbling Vireo, singing unseen in heavy foliage at Veracruz, May 11, 1939, was presumably a transient, because *amauronotus* is not certainly known from below about 3500 feet.

Black and White Warbler, *Mniotilta varia*.—Winters commonly in suitable areas throughout, from July 25 (seen near La Joya, 1952) to May 15 (Wetmore, 1943: 311).

\*Swainson's Warbler, *Limnethlypis swainsonii*.—Status uncertain, but presumably a rare or casual transient. Two records: a specimen taken near the city of Veracruz, exact date not stated (Salvin and Godman, 1889: 236), and a spring sight record by Davis and Morony (1953a: 353) near San José del Carmen.

\*Worm-eating Warbler, *Helminthos vermivorus*.—Not rare locally on migration and in winter. "Mountains of Orizaba" (Sumichrast, 1869: 546) and Jalapa (Sclater, 1859a: 363) were the only original Veracruz references until the five late February and March records from near Tres Zapotes, published by Wetmore (1943: 311). Davis and Morony (1953a: 353) have since recorded it near San José del Carmen. It has, however, been taken in southern Tamaulipas in January (Richmond, 1896: 631).

\*Golden-winged Warbler, *Vermivora chrysoptera*.—Rare and little-known, but perhaps a regular transient. Hellmayr (1935: 337) indicates that the missing type of *Sylvicola inornata* Swainson came from near the city of Veracruz. Davis and Morony (1953a: 353) have recently published a spring sight record from near San José del Carmen.

\*\*Blue-winged Warbler, *Vermivora pinus*.—Rare transient, perhaps wintering in lowlands. Except for the old records from Veracruz, Jalapa, and Córdoba cited by Salvin and Godman (1887: 115), it is known only from a male taken March 11 at Tres Zapotes (Wetmore, 1943: 311) and a male taken April 7 at Jalapa (Chapman, 1898: 24).

\*Tennessee Warbler, *Vermivora peregrina*.—Fairly common spring transient, chiefly at medium altitudes; as yet no autumn or winter records. Except for Carriker's April 20 specimen from 5400 feet on Volcán San Martín (Wetmore, 1943: 311), and Davis and Morony's (1953b: 360) April observation near Nanchital, all Veracruz records so far happen to be from Jalapa and vicinity. De Oca (Sclater, 1862b: 29) and Chapman (1898: 24) took it there, the latter on April 18. I saw single birds at Coatepec on April 11, 17, and May 5, and at Jalapa on April 23 and 27.

Eastern Orange-crowned Warbler, *Vermivora celata celata*.—Fairly common winter visitant until early April. Found throughout, from sea level to 8500 feet or higher. One from the Río Pánuco taken in the "winter of 1942" (P) may be referable to *orestera*, as it is somewhat bright for true *celata*.

Eastern Nashville Warbler, *Vermivora ruficapilla ruficapilla*.—Common transient above 2500 feet, apparently scarce near sea level. Doubtless winters, but no January or February specimens seen. A March 6 example of the eastern race was taken by H. O. Wagner "east of Las Vigas" (A), while the latest spring specimen is April 23, Las Vigas (H). Other skins of the nominate race, which I have personally examined, are from Jalapa (April 7, 7, and 18; H) and Río Pánuco (April 4 and 5; P). The species was noted by me at Córdoba: 7 on March 3, 5 on March 5; at Las Vigas: 2 on April 2, 5 on April 8, and 1 on April 9; at Coatepec: 17 on April 11, 14 on April 17; at Jalapa: 1 on April 16, 1 on April 21 (a female of eastern race taken), 11 on April 23, and 2 on April 27.

\*Western Nashville Warbler, *Vermivora ruficapilla ridgwayi*.—Apparently less numerous than last. Specimens examined from Orizaba (2 undated; F), Teocelo (March 6; F), Jalapa (April 15, 15; F); and Pánuco (March 25 and April 20; H).

Northern Parula Warbler, *Parula americana pusilla*.—Uncommon in winter and

on migration from sea level up to at least 4000 feet at Orizaba (Sumichrast, 1869: 546). Specimens of this race (including "*ramalinae*") examined from Paso Nuevo (March 12; F), Tlacotalpam (January 26; H), and Tres Zapotes (see Wetmore, 1943: 311-312). Undoubtedly remains in Veracruz until late April, since Gillin shot one at Tampico on April 25 (P). There is an old record for Jalapa (Sanchez, 1878: 99). The species was noted by me only at Jesús Carranza on March 11 (two) and 12 (one).

Eastern Yellow Warbler, *Dendroica petechia aestiva*.—Presumably regular on migration and perhaps in winter. Since most North American races of the Yellow Warbler are difficult to identify in the plumages usually worn in México, the relative frequency of the various subspecies and possible differences in their season of occurrence are still poorly understood, despite the goodly number of specimens available. The following have been identified as *aestiva*: an Orizaba specimen taken by Mann during the "winter of 1912-1913" (F), a male by me at Córdoba on May 22 (D), and a May 26 male from Boca del Río (Lowery and Dalquest, 1951: 626).

\*Alaska Yellow Warbler, *Dendroica petechia rubiginosa*.—Apparently regular on migration coastwise. Probably occurs inland, and during the winter. Brodtkorb (1943: 76) records four from Minatitlán, April 25-30; Wetmore (1943: 312) two from the Tres Zapotes area, April 2 and 6, and one from El Conejo, May 15. I have also examined two January 15 males from Tlacotalpam (H) which seem to belong here.

\*Newfoundland Yellow Warbler, *Dendroica petechia amnicola*.—Apparently regular and fairly common in winter and on migration, chiefly along coastal plain. The following have been identified as *amnicola*: two taken by Brodtkorb (1948: 37) on March 12 and 15; single males April 5 and May 3 (Lowery and Dalquest, 1951: 626); two from Minatitlán, April 24 and 28 (Brodtkorb, 1943: 76); and the series secured by Wetmore and Carriker between January 17 and April 13 (Wetmore, 1943: 313).

\*Sonora Yellow Warbler, *Dendroica petechia sonoriensis*.—Status uncertain; probably a regular winter visitant in lowlands. Two were taken by Colburn at Tlacotalpam, January 15 and 20, 1901 (H).

Magnolia Warbler, *Dendroica magnolia*.—One of the commonest warblers in winter and on migration up to at least 4500 feet. In 1939, I noted one to eight almost daily from my arrival in late February through May 16, though none was seen above Jalapa. It doubtless reaches Veracruz in late summer, but as yet October 18 (Lowery and Dalquest, 1951: 626) seems to be the earliest fall date.

Eastern Myrtle Warbler, *Dendroica coronata coronata*.—Though few old specimens have been critically re-examined, this is presumably the more numerous race of Myrtle Warbler in Veracruz. The species is decidedly common in winter and on migration from sea level to 9000 feet, remaining until at least April 17 (three seen at Coatepec).

\*Alaska Myrtle Warbler, *Dendroica coronata hooveri*.—Probably regular in winter, though as yet recorded only by Oberholser (1918b: 466) and Wetmore (1943: 313).

\*Pacific Audubon's Warbler, *Dendroica auduboni auduboni*.—Common winter visitant between about 4600 and 12,000 feet. Sumichrast (1869: 547) reported it from Tecamaluca, 1400 meters, but all other records, except Sallé's old specimen supposedly from Orizaba (Sclater, 1860: 250), come from 7000 feet or higher. Chapman (1898: 39) took one at Las Vigas on April 23 (the latest Veracruz spring date). Stone (1890: 216) found it "common in the pine forest of Orizaba at an elevation of 10,000-12,000 ft." above Chalchicomula, just over the state line in Puebla. Taken by H. O. Wagner, March 5, 1949, on north slope of Cofre de Perote (A). Noted by me only near Las Vigas, where common during first third of April (see Sutton and Burleigh, 1940a: 241).

\*Black-throated Gray Warbler, *Dendroica nigrescens*.—Rare or casual in winter in the highlands: Orizaba (see Sumichrast, 1869: 547).

\*Townsend's Warbler, *Dendroica townsendi*.—Regular winter visitant in small numbers between elevations of about 8000 and 10,000 feet. Unrecorded until April 4, 1939, when I saw three males at about 10,000 feet, near Las Vigas, and secured one (Sutton and Burleigh, 1940a: 241). On April 8 one was noted just below Las Vigas. Traylor collected a male at 8500 feet near Perote on September 6, 1948 (N).

Northern Black-throated Green Warbler, *Dendroica virens virens*.—Common transient at medium altitudes (2500–5000 feet), less numerous higher and lower. Winters regularly up to at least 4000 feet. Extreme dates are September 2 (young male taken by Traylor at Perote; N) and May 11 (seen by me at city of Veracruz).

\*Hermit Warbler, *Dendroica occidentalis*.—Common between 7000 and 10,000 feet from September 2 (Traylor near Perote; N) until latter half of April (taken by C. B. Isham at Las Vigas). Sutton and Burleigh (1940a: 241) found it common at Las Vigas in early April, where I noted between three and eight daily. Lowery and Dalquest (1951: 627) record two from Las Vigas, November 4 and April 2. Sumichrast (1869: 546) listed it for Moyoapam at 2500 meters, and Botteri took one supposedly at Orizaba, but very likely well above that town (G).

\*Cerulean Warbler, *Dendroica cerulea*.—Probably a rare or casual transient; two records: a male secured by me in deep woods near Jalapa, April 25, 1939 (D), and one or more seen by Davis and Morony (1953a: 353) near San José del Carmen.

\*\*Blackburnian Warbler, *Dendroica fusca*.—Apparently a rather rare transient; may winter occasionally. Salvin and Godman (1887: 134) cite "Vera Cruz." De Oca took it near Jalapa (Sclater, 1859a: 363). Sumichrast (1869: 547) considered it "very rare" at Orizaba, whence comes the only Veracruz specimen I have seen: an adult male taken by Mann during the "winter of 1912–1913" (F). In 1939 I saw two separate males at Coatepec on May 5, and one female at Veracruz on May 11. Davis and Morony (1953a: 353) record it from near San José del Carmen.

Sycamore Yellow-throated Warbler, *Dendroica dominica albilora*.—Regular but uncommon on migration and in winter up to at least 4500 feet, August 10 (Sumichrast, 1869: 547) to March 25 (Wetmore, 1943: 314).

\*Northern Grace's Warbler, *Dendroica graciae graciae*.—May winter regularly in highlands, but as yet only one or two records: a Las Vigas male taken by Sutton on April 2, definitely of the nominate race (Sutton and Burleigh, 1940a: 241), and an undated mounted male specimen from Jalapa, labelled "*Dendroica graciae decora*" (L). In the absence of comparative material I was unable to determine whether the latter represents the first Veracruz record of *decora* or is merely a misidentified example of the typical race.

\*Chestnut-sided Warbler, *Dendroica pensylvanica*.—Apparently a rather rare transient, long known from Jalapa (Sclater, 1859a: 363) and Playa Vicente (Sclater, 1859b: 374). Dalquest took a male near Jesús Carranza on May 4 (Lowery and Dalquest, 1951: 627), and I have seen two undated adult males in spring plumage from Jalapa (L). Well-colored males were observed at Coatepec on May 5 (two) and at Jalapa on May 6 (one). Davis and Morony (1953a: 353 and 1953b: 360) saw the species near San José del Carmen and Nanchital.

Eastern Oven-bird, *Seiurus aurocapillus aurocapillus*.—Uncommon in migrations and winter from sea level up to 4500 feet or more. Specimens of nominate race examined from Orizaba (two without data; F), near Potrero (April 13; C), and, as recorded by Wetmore (1943: 314), from Tres Zapotes and El Conejo. Lowery and Dalquest (1951: 627) list a female taken on October 17 at Jalapa and another speci-

men taken March 30 at Jesús Carranza. Chapman (1898: 24) took a male (race?) at Jalapa on April 6. This easily overlooked species was noted by me only at Jesús Carranza on March 15 (two, separately) and at Jalapa on April 21 (two).

Common Northern Water-Thrush, *Seiurus noveboracensis noveboracensis*.—Status obscured by next race, but almost surely rather common on migration from sea level up to at least 8000 feet. Winter specimens not available, but this may be of no significance. Critically determined examples include an April 26 female from Las Vigas (Chapman, 1898: 40), an undated specimen from Orizaba (F), and an April 20 female from near Potrero (C). The species (race?) was noted by me only twice: at Jalapa on May 6 and at Veracruz on May 10.

Grinnell's Northern Water-Thrush, *Seiurus noveboracensis notabilis*.—Status obscured by preceding race, but apparently locally common in winter and on migration in the lowlands, and not rare during migrations at higher elevations. Subspecifically determined examples include a January 29 female from Tlacotalpam (H), a May 21 female from Presidio (Bangs and Peters, 1927: 484), and the five recorded by Wetmore (1943: 314), February 6 to April 13.

Louisiana Water-Thrush, *Seiurus motacilla*.—Fairly common locally on migration and in winter from sea level up to about 8000 feet. One or two noted by me on July 29, 31, and August 1 at Jalapa; August 13 at Orizaba; August 24 and 27 at Jesús Carranza; August 26 at Puerto México; August 30 at Atoyac; March 4 at Motzorong; March 13 at Isla; March 19 at Jesús Carranza. Latest spring date for southern Veracruz is March 25 (Wetmore, 1943: 314), for northern, April 1 at Pueblo Viejo (N) and April 2 at Río Pánuco (P). Winter or very early spring dates are February 26 at Achotal (N) and February 24 near Potrero Viejo (Lowery and Dalquest, 1951: 627). Earliest fall specimens: "August" (Ferrari-Perez, 1886: 136), and August 29 at 4500–5000 feet, east of Teziutlán (N); but from just outside of Veracruz, at 8000 feet near Alchichica, Puebla, there is a July 26 skin (T).

\*Kentucky Warbler, *Oporornis formosus*.—Fairly common locally in winter and on migration in southern lowlands. One old record for Playa Vicente (Slater, 1862a: 19) was the only evidence of its occurrence in Veracruz until the work of Wetmore and Carriker, who took specimens on seven dates between January 19 and April 8 (Wetmore, 1943: 314–315). More recently, Dalquest shot a male near Jesús Carranza on March 30, 1949 (Lowery and Dalquest, 1951: 627), and Davis and Morony (1953a: 353) saw the species near San José del Carmen.

\*Mourning Warbler, *Oporornis philadelphia*.—Fairly common transient in May, chiefly along coastal plain. Unrecorded in southward flight, but probably regular in late summer (eleven August and September Tamaulipas specimens recorded by Phillips, 1911: 86). Sanchez (1878: 99) listed *Geothlypis philadelphia* from Orizaba, presumably based on Slater (1862b: 27), whose reference is referred by Ridgway (1902: 634) to *O. tolmiei*.

On May 10, 1939, in thickets just back of the dunes at Veracruz I secured a male Mourning Warbler (D) and saw near it at least five others of both sexes. Two days later I saw another male at Alvarado.

In 1942, the U. S. National Museum received from A. E. Colburn a male taken by P. W. Shufeldt in "Vera Cruz" on an unknown date (see Wetmore, 1943: 315). From what Mr. Shufeldt once wrote me about his Mexican fieldwork, the place of capture was probably La Buena Ventura or nearby Buena Vista. This may well be the "Veracruz—Buena Vista, May 13" occurrence listed by Bent (1953: 532), which, incidentally, seems to be the first Mexican specimen of the Mourning Warbler, because it must date back to 1901, the only year Colburn and Shufeldt (who are responsible for all Buena Vista, Veracruz, bird records) collected there.



In 1940 Carriker took three males between May 5 and 10 near Tres Zapotes and low on Cerro de Tuxtla, as recorded by Wetmore (*loc. cit.*). Brodkorb (1943: 77) reports a May 22 specimen from Tabasco.

MacGillivray's Warbler, *Oporornis tolmiei* (subsp?).—Uncommon transient from sea level to 9000 feet or more. To be looked for in winter. Noted by me at Jalapa on April 21 (one male) and at Veracruz on May 10 (two males associating with Mourning Warblers in thickets near the beach). Sutton and Burleigh (1940a: 241) report three on April 4 at 8000 to 9000 feet near Las Vigas, where Chapman (1898: 40) took two males, one of them on April 21 (H). Earliest fall date on hand is September 5 at Perote (N). Because of lack of comparative material and slight racial differences, I have not attempted subspecific identification of the few Veracruz skins examined. Nevertheless, Lowery and Dalquest (1951: 627) have provisionally allocated to *austinsmithi* a Jalapa male taken on the late date of May 29.

Northern Yellowthroat, *Geothlypis trichas brachidactyla*.—Presumably regular in winter and fairly common from sea level up to at least 4000 feet. Specimens identified as *brachidactyla* include the four reported by Wetmore (1943: 315), also one from Teocelo, March 2 (F), and one I took at Veracruz on May 10 (D). I found the species much less common than expected, never seeing more than three in a day.

Maryland Yellowthroat, *Geothlypis trichas trichas*.—Apparently quite regular in winter, remaining at least until mid-April. Specimens identified as *trichas* include the four recorded by Wetmore (1943: 315), also birds from Papantla, March 7 (G), Fortín, March 23 (Lowery and Dalquest, 1951: 628), and Rivera, April 18 (G).

\*Athens Yellowthroat, *Geothlypis trichas typhicola*.—Probably regular in winter, but so far the only satisfactory records known to me are the four specimens from Tres Zapotes, January 18 to March 5, reported by Wetmore (1943: 315), and the May 26 male from Boca del Río recorded by Lowery and Dalquest (1951: 628).

\*Western Yellowthroat, *Geothlypis trichas occidentalis*.—Status uncertain; two records: Lowery and Dalquest (1951: 628) have assigned to this race March 23 and May 3 specimens, both shot near Jesús Carranza.

Eastern Yellow-breasted Chat, *Icteria virens virens*.—Common in winter and on migration in lowlands, less numerous up to 4500 feet or more, where it is probably chiefly a transient, remaining until at least May 7. That it winters even in extreme northern Veracruz is indicated by a February 19 specimen from Río Pánuco (P).

\*Long-tailed Yellow-breasted Chat, *Icteria virens auricollis*.—The only Veracruz records for this race are those of Lowery and Dalquest (1951: 629), some of which were admittedly doubtful. I have generously been given access to these specimens and would confidently refer to *auricollis* only one of them: Kansas University Museum of Zoology No. 23,926, from near Potrero, February 16. This is a male (wing measuring 78 mm., tail 81) with deep yellow underparts, but whose color above appears closer to that of eastern birds, though strictly comparable material was not available.

\*Hooded Warbler, *Wilsonia citrina*.—Fairly common locally in winter and on migration from sea level to 4000 feet at Orizaba (three undated males; F and L; also see Sumichrast, 1869: 547). Taken by Sallé at Córdoba (Sclater, 1856b: 291). Near Tres Zapotes, Wetmore and Carriker found it "not uncommon" and took specimens between January 19 and March 30 (Wetmore, 1943: 317). There are three records from Motzorongo: September, 1931 (L), March 24, 1932 (L), and December 9, 1946 (Lowery and Dalquest, 1951: 629). I observed it only twice, single adult males on August 23 and March 10, both at Jesús Carranza. Irby Davis (1952a: 315) saw one or more near Catemaco in April.



Wilson's Pileolated Warbler, *Wilsonia pusilla pusilla*.—The species is decidedly common in winter and on migration virtually throughout the state. I saw from several to 24 nearly every day from my arrival in late February until May 10. They seemed about equally common at all elevations up to 8000 feet or more. The species arrives in early September (see under *W. pusilla pileolata*). The nominate race is probably less common than *pileolata* in Veracruz. Wetmore (1943: 317) records two March examples of *pusilla* from Tres Zapotes and another from the summit of Volcán San Martín, April 22. Lowery and Dalquest (1951: 629) list three skins of *pusilla* taken between September 30 and March 26. I have also examined two undated Orizaba specimens (F), a February 7 female from Motzorongo (F), and two from Río Pánuco (P).

Northern Pileolated Warbler, *Wilsonia pusilla pileolata*.—Probably most of the very numerous Pileolated Warblers in Veracruz belong to this race. Specimens examined from all parts of the state from as early as September 6 (taken by Traylor at Perote; N) until April 20 (shot by Lea near Potrero; C).

\*Golden Pileolated Warbler, *Wilsonia pusilla chryseola*.—Little known but perhaps regular in winter. The only records are the two March specimens from Tres Zapotes reported by Wetmore (1943: 317). I believe I have seen no equally bright ones from Veracruz.

Canada Warbler, *Wilsonia canadensis*.—Uncommon transient from sea level to about 8000 feet (two from Las Vigas, undated; L). Lowery and Dalquest (1951: 630) furnish both the earliest (March 8) and latest (May 28) spring records for Veracruz. Noted by me at Jalapa on April 21 and May 8, at Xico on May 7 (three), at Veracruz on May 10 (three), and at Alvarado on May 12. Unrecorded as yet in fall, but presumably regular in August and September.

American Redstart, *Setophaga ruticilla*.—The species winters commonly in the lowlands and is fairly numerous up to about 4000 feet during migration, but is apparently scarce above that elevation. Remains until at least May 10 (one seen at Veracruz, 1939). Midwinter specimens include a January 20 male from near Jesús Carranza (E) and a January 27 skin from Tres Zapotes (Wetmore, 1943: 318). I have not yet had an opportunity to determine Veracruz specimens subspecifically, but Wetmore (1949: 139) has recently recorded *S. r. tricolora* from Tres Zapotes, and assigned to that race a March 8 female from Potrero (Lowery and Dalquest, 1951: 630).

\*Western Meadowlark, *Sturnella neglecta*.—Added to the state list by Dr. George B. Saunders, who kindly informs me (*in litt.*): "A scarce winter visitant in northern Veracruz. A male (G. S. No. 2523) was collected November 30, 1949, west of Tampico near Cacalilao, Veracruz, and a female January 14, 1952, two miles west of Tamós. The male was taken from a small flock, but the female was alone. Both gave typical *neglecta* call notes."

Orchard Oriole, *Icterus spurius*.—Regular and locally common in winter in lowlands of southern Veracruz. As a transient, abundant on coastal plain, common up to 4500 feet, rare at 8200 feet, just outside of Veracruz near Chalchicomula, Puebla (Stone, 1890: 214). No evidence whatever of breeding, though present from July 14 (when I found them becoming common near Tecolutla in small flocks which included adult males) and July 16 (Warner and Mengel, 1951: 294) until May 15 (Lowery and Dalquest, 1951: 633) or later (a May 30 specimen from Chiapas seen; A). By mid-May—my last were at Córdoba, May 15—a few males are in full song, but these individuals, like those in mid-July, are restless and quite evidently migrating. I found the Orchard Oriole to be one of the very commonest migratory

birds at lower altitudes, perhaps most numerous in August and March. At Jesús Carranza flocks of 50 to 80 often came to roost at night in cattails (*Typha*), much after the manner of Redwings (*Agelaius*).

\*Audubon's Black-headed Oriole, *Icterus graduacauda audubonii*.—Status uncertain; perhaps regular in winter, at least in extreme north. U. S. National Museum No. 76,799, taken by de Oca at Jalapa, has been identified by Ridgway as *audubonii* (G). Hellmayr (1937: 144) lists three from Tampico, presumably taken just north of the Veracruz line.

Baltimore Oriole, *Icterus galbula*.—Rather uncommon in winter and on migration at low and medium altitudes, August 23 (taken by Traylor at about 4500 feet, highest Veracruz record, east of Teziutlán; N) to May 13 (Mirador; G). One or two noted by me as follows: at Córdoba on March 3 and 5, at Jesús Carranza on March 11 and 18 (male taken), and at Coatepec on April 11.

\*Common Bullock's Oriole, *Icterus bullockii bullockii*.—Probably a rare winter visitant in mountains; as yet only two records: a male shot by Sutton at about 8200 feet near Las Vigas on April 2 (Sutton and Burleigh, 1940a: 242), and an adult male clearly seen by me at Coatepec, April 11, 1939.

\*Brewer's Blackbird, *Euphagus cyanocephalus*.—Regular winter visitant in highlands down to about 4000 feet. Sumichrast (1869: 553) recorded it from the valley of Orizaba. P. M. Toro long ago shot two at or near the city of Orizaba (F). Chapman (1898: 42) saw "several flocks" at Las Vigas in late April and collected a pair, while Isham secured a male there on April 20 (F). Sutton and Burleigh (1940a: 242) saw "a small flock a mile west of Las Vigas on . . . April 5."

\*Eastern Brown-headed Cowbird, *Molothrus ater ater*.—Perhaps only casual in winter. The only satisfactory record known to me is the February 16 female from Tlacotalpam recorded by Wetmore (1943: 321).

Nevada Brown-headed Cowbird, *Molothrus ater artemisiae*.—Status obscured by resident form, but probably regular in winter until May 14 (a male measuring wing 111 mm., tail 75, culmen from base 17.1, taken by me at Córdoba).

\*Western Tanager, *Piranga ludoviciana*.—Apparently rare but regular winter visitant in mountains down to an elevation of about 4000 feet. Sclater (1856a: 125) reported this species from Orizaba, and Sumichrast (1869: 550) from the state of Veracruz in winter. I have examined a male and female taken at or near Orizaba (F), also two females from Jalapa (F). These records, all old and undated, appear to be the only ones for Veracruz. However, at Altamira, near sea level in extreme southern Tamaulipas, Armstrong collected "numerous specimens (January and February)," as reported by Richmond (1896: 631). Presumably, therefore, this species will be found to winter regularly in the northern Veracruz lowlands.

Eastern Summer Tanager, *Piranga rubra rubra*.—Not uncommon on migration from sea level up to 8000 feet or more (Las Vigas, April 25; F). Winters regularly, but perhaps rarely, at low altitudes: Jaltipán, February 2 (G) and Motzorongo, February 25 (G). Extreme dates are August 26 (at about 4500 feet, east of Teziutlán; N) and May 6 (see below). The species was noted by me at Motzorongo: 3 on March 4; at Isla: 1 on March 13; at Jalapa: 1 on April 18 (a molting male, collected) and one fully red male seen on May 6. The many Veracruz skins examined all belong to the nominate race.

Rose-breasted Grosbeak, *Phœticus ludovicianus*.—Uncommon to rare in winter, but fairly common locally in migrations, from sea level up to 4500 feet or more. Remains until at least April 18.

\*Eastern Blue Grosbeak, *Guiraca caerulea caerulea*.—Status obscured by other

forms, but probably winters regularly in small numbers. Dwight and Griscom (1927: 4) include Veracruz in the winter range of *caerulea*. Critically determined specimens examined by me are a November 29, 1868, bird from Orizaba (identified as *caerulea* by Oberholser in 1936; G), a March 7 male (wing 87 mm., tail 68, bill 17) taken at Coscomatepec (H), a March 31 male (wing 89, tail 70.5, bill 17, both wing-bars dark) from Jalapa (H), and an April 13 male (wing 90, tail 68, bill 17.5) from Jalapa (H). The last was originally recorded by Chapman (1898: 28) as *eurhyncha*.

Arizona Blue Grosbeak, *Guiraca caerulea interfusa*.—Status obscured by other forms, but probably a regular winter visitant in moderate numbers. Due to long-existing confusion between this form and the breeding *eurhyncha*, satisfactorily determined examples of *interfusa* from Veracruz are few. Wetmore (1943: 333) records a male from Tres Zapotes, March 21, and there is an undated Orizaba male in Washington (U. S. National Museum No. 38,174) identified as *interfusa* by Oberholser in 1936.

Indigo Bunting, *Passerina cyanea*.—Regular but local and uncommon during winter along coastal plain, locally common during migrations from sea level up to about 4000 feet (undated Orizaba specimens; F; G). I saw it only at Motzorongo (three on March 4) and Jesús Carranza (two on March 11), but Dalquest found it "common in open fields in spring, usually in flocks of ten to fifty individuals" (Lowery and Dalquest, 1951: 639). Probably winters in extreme northern Veracruz, as I have seen a February 21 skin from Pánuco (H), whence comes the latest spring record, May 15 (H).

Eastern Painted Bunting, *Passerina ciris ciris*.—Status uncertain. Presumably rare or casual. Recorded from Tres Zapotes by Wetmore (1943: 334), and from near Potrero and El Faro by Lowery and Dalquest (1951: 640). Storer (1951: 10) has recently shown that the following form accounts for virtually all of the wintering Painted Buntings of México (exclusive of Yucatán).

Western Painted Bunting, *Passerina ciris pallidior*.—See preceding form. Winters regularly in lowlands and sparingly up to 2000 feet or more. Possibly breeds, though the adult male (testes somewhat enlarged) taken near Boca del Río, July 20 (Warner and Mengel, 1951: 295) may have been a post-breeding migrant. Specimens of *pallidior* are numerous, and show that this form is widespread, reaching at least 4000 feet during migration, and remaining in spring until at least April 28.

Dickcissel, *Spiza americana*.—Regular, not uncommon, early fall and late spring transient along coastal plain, more rarely inland as high as 8000 feet (Las Vigas; L). Though Sumichrast (1869: 552) thought it wintered, all dated records indicate that it is just a transient. Arrives in fall by August 23, when I saw a male and shot a female at Jesús Carranza. My only others were seen in May: a male at Veracruz on the 11th, and a flock of twelve at Presidio on the 18th. This is latest spring record for Veracruz, although Godman took a male at Jalapa in May, 1888 (exact date not on label; N). Other specimens examined from near Tampico, August 25 (P), Mirador, no date (G), Rivera, April 22 (G), and Minatitlán, April 24 (A).

\*Cassin's Finch, *Carpodacus cassinii*.—Status uncertain; presumably a rare or casual winter visitant to west-central highlands. Apparently all Veracruz references to this species originate from a Sartorius-taken male whose label, reading "pine forests above Mirador . . . June 1864" (G), may be misdated.

\*Eastern American Goldfinch, *Spinus tristis tristis*.—Probably rare or casual in winter; one record: American Museum of Natural History No. 230,412, a male (wing 71 mm., tail 45) taken at Pánuco on February 20, 1923, by W. W. Brown, Jr. In color and markings this individual seems definitely referable to the eastern

race, here reported for the first time so far south, though Sutton and Burleigh (1939: 44) have recorded this race from near Monterrey, Nuevo León.

\*Pale American Goldfinch, *Spinus tristis pallidus*.—Probably rare but regular in winter south to central Veracruz. I have seen a March 6 female from Teocelo (F), and two from Pánuco (both H): a March 8 male (wing 77 mm., tail 49) and a March 5 female (wing 72, tail 46). Jalapa skins of this species listed by Sharpe (1888: 195) are assigned to *pallidus* by Hellmayr (1938: 296).

\*Eastern Savannah Sparrow, *Passerculus sandwichensis savanna*.—Probably regular and locally common in winter, though so far known only from Carriker's three February specimens from Tlacotalpam and El Conejo (Wetmore, 1943: 338), and from a November 14 female taken near Tehuatlán (Lowery and Dalquest, 1951: 644). The species (race?) was noted by me at Veracruz on February 28 (three) and May 10, and at Isla on March 13 and 14 (about twenty).

The few old Veracruz specimens of *P. sandwichensis* need to be re-examined.

\*Nevada Savannah Sparrow, *Passerculus sandwichensis nevadensis*.—Status uncertain; probably winters regularly in mountains. Four males collected by me in grassy fields just east of Perote, May 25 and 26, 1939 (D), had greatly enlarged testes, were singing freely and chasing one another. Their activity and the late date led me to suppose they were preparing to nest there. Messrs. Peters and Griscom, however, kindly examined the quartet and pronounced them all "ultratypical of *nevadensis*," and therefore presumably just belated migrants.

\*Eastern Grasshopper Sparrow, *Ammodramus savannarum pratensis*.—Rare or perhaps only casual in winter; one record: El Conejo, February 12 (Wetmore, 1943: 338). This female (U. S. National Museum No. 360,472) measuring, wing 61 mm., tail 44.5, does not seem to me dark enough above for typical *pratensis*, though I list it as such on Dr. Wetmore's authority.

Western Grasshopper Sparrow, *Ammodramus savannarum perpallidus*.—Status obscured by presence of *pratensis* and of the resident *bimaculatus*, but apparently a regular winter visitant in lowlands, and sparingly up to 3500 feet. Critically determined specimens examined from Mirador, December 8 (Lowery and Dalquest, 1951: 644); Pánuco, February 11 and 14 (both H); Tejería, March 9 (A); city of Veracruz, March 11 (A); and Minatitlán, April 24 (A). The last three have been recorded by Brodkorb (1948: 38, and 1943: 87).

\*\*Western Vesper Sparrow, *Pooecetes gramineus confinis*.—Seemingly rare in winter, western Veracruz only. Salvin and Godman (1887: 383) state that de Oca and Höge found the Vesper Sparrow at Jalapa, and I have seen an undated male *confinis* from Orizaba (F). The only recent records are a male (race?) and a female of *confinis* from near Zacualpilla, November 9, 1949 (Lowery and Dalquest, 1951: 644).

\*Western Lark Sparrow, *Chondestes grammacus strigatus*.—Uncommon winter visitant from sea level up to at least 4500 feet. At El Conejo Carriker shot two from a small flock on February 10 (Wetmore, 1943: 338). C. B. Worth took a male of *strigatus* at Río Pánuco, March 28 (P). Sumichrast (1869: 552) included this species among the migrants wintering in Veracruz. Sometime between March 28 and April 16, 1897, Chapman (1898: 29) observed one near Jalapa, where on April 21, 1939, I saw a flock of twelve (race?).

\*\*Rock Rufous-crowned Sparrow, *Aimophila ruficeps eremoeca*.—Status obscured by resident *boucardi*, but *eremoeca* perhaps winters regularly in mountains near Puebla border. As yet, known only from the March specimen from Maltrata mentioned by Ridgway (1901: 251).

Western Chipping Sparrow, *Spizella passerina arizonae*.—Doubtless regular and fairly common in winter down to about 4500 feet elevation, though as yet dated specimens taken only in April. Chapman's three from Jalapa, April 5-6 (H), his April 22 male from Las Vigas (H), Isham's April 25 female from Las Vigas (F), and my April 8 female from Las Vigas (D) all are *arizonae*.

\*Clay-colored Sparrow, *Spizella pallida*.—One record: a male shot near Tierra Colorada, March 14, 1941, by I. J. Cantrall (A), and recorded by Brodtkorb (1948: 38). Probably regular in winter, however, because just outside of Veracruz it has been taken at Tampico (four, March 29 to 31, 1923; P) and at Chalchicomula (Ridgway, 1901: 325).

\*Worthen's Sparrow, *Spizella wortheni*.—One record: a single individual (R) collected by Dalquest two kilometers west of Limón, 7500 feet, September 24, 1948 (Lowery and Dalquest, 1951: 645). Perhaps of regular occurrence, however, since Chalchicomula, just over the line in Puebla, is listed for this little-known sparrow by Ridgway (1901: 322).

Northern Lincoln's Sparrow, *Melospiza lincolnii lincolnii*.—The species is very common in winter throughout Veracruz from sea level to 10,000 feet elevation or higher. I noted it in numbers at almost every place visited during winter and spring until May 12 at Alvarado. Veracruz specimens identified since the description of *alticola* in 1935 are mostly of the nominate race.

Montane Lincoln's Sparrow, *Melospiza lincolnii alticola*.—Status obscured by preceding form. Referable to *alticola* are a male from Minatitlán, April 23 (Brodtkorb, 1943: 88), and three females discussed by Wetmore (1943: 340) from Tres Zapotes, March 18 and April 13, and Tlacotalpam, February 5.

\*Chestnut-collared Longspur, *Calcarius ornatus*.—Rare or casual winter visitant in mountains; no recent records. Long ago Sclater (1860: 251) recorded two specimens from near Orizaba, the city to which Sumichrast (1869: 551) wrote that it descended rarely from the "great plains of the plateau"—presumably in the state of Puebla.

#### HYPOTHETICAL LIST

American Long-eared Owl, *Asio otus wilsonianus*.—The "*Asio americanus*" recorded by Sumichrast (1881: 237) from Orizaba may or may not be this species.

White-throated Swift, *Aëronautes saxatalis* (subsp.).—Sumichrast (1869: 562) wrote: "I think that I have recognized the *Panyptila melanoleuca* in a species from the mountains of Orizaba."

Lesser Cliff Swallow, *Petrochelidon pyrrhonota lachina*.—See *Petrochelidon* (species?) in foregoing list.

Western Robin, *Turdus migratorius propinquus*.—All alleged Veracruz records for this form appear referable to *T. m. phillipsi*.

Willow Veery, *Hylocichla fuscescens salicicola*.—Sumichrast (1869: 543-544) wrote: "A small *Hylocichla* . . . seems to me to have presented all the characteristics of the *T. fuscescens*, as given in Prof. Baird's 'Birds of North America'." Ridgway (1907: 68), not having seen Sumichrast's specimen, referred it with a question mark to *salicicola*. Recently Blake (1953: 429), in his excellent field-guide, followed Ridgway, though omitting the question-mark.

Golden-cheeked Warbler, *Dendroica chrysoparia*.—Bent (1953: 321) records this species from "Teziutlán, western Veracruz," but this should read Teziutlán, Puebla. The source of this record is presumably the December female taken by Ferrari-Perez (1886: 137).

Scott's Oriole, *Icterus parisorum*.—The numerous Veracruz references to this

species in the literature appear to be based solely on the following statement of Sumichrast (1869: 553): "occurs chiefly in the temperate parts, where it breeds, but is not exclusively confined there, for it is found in the alpine region to the height of at least 1600 metres, near Orizaba, and on the plateau at even a higher elevation." Inasmuch as all recent collectors, so far as I know, have failed to find *parisorum* in Veracruz, Sumichrast must have confused it with one of the many other Mexican orioles, most likely with the similar highland species, *I. wagleri*, which in turn Sumichrast (*op. cit.*) evidently mistook for the very closely related lowland form, *I. prothemelas*. Pending further evidence, therefore, Scott's Oriole should no longer be credited to Veracruz.

#### SUMMARY

At least 211 species and 32 additional subspecies of North American birds have been found in the state of Veracruz, México, as non-breeders. Arranged, in so far as possible, by where they nest, they fall into the following categories:

1. Breed chiefly or exclusively in temperate latitudes	
a. Breed chiefly or exclusively east of 100th meridian	91
b. Breed chiefly or exclusively west of 100th meridian	78
c. Breeding range continent-wide, or nearly so	40
2. Breed chiefly or exclusively in arctic North America	29
3. Not classifiable as above	5
	<hr/>
Total forms	243

The present status in Veracruz of each migrant is briefly outlined, including altitudinal preferences and seasons of occurrence, when known. Though the great majority is represented by Veracruz specimens, a large percentage of which the writer has checked, the following species are included on the basis of sight records only: Lesser Snow Goose (*Chen hyperborea*), Blue Goose (*Chen caerulescens*), Swallow-tailed Kite (*Elanoides forficatus*), Bald Eagle (*Haliaeetus leucocephalus*), Prairie Falcon (*Falco mexicanus*), Common Gallinule (*Gallinula chloropus*), Semipalmated Ringed Plover (*Charadrius hiaticula semipalmatus*), Ruddy Turnstone (*Arenaria interpres*), White-rumped Sandpiper (*Erolia fuscicollis*), Stilt Sandpiper (*Micropalama himantopus*), Ring-billed Gull (*Larus delawarensis*), Bonaparte's Gull (*Larus philadelphia*), Caspian Tern (*Hydroprogne caspia*), and Bank Swallow (*Riparia riparia*). Wilson's Petrel (*Oceanites oceanicus*), Gannet (*Morus bassanus*), and Golden-winged Warbler (*Vermivora chrysoptera*) may also belong in the sight-record-only category.

While in Veracruz, land birds from western North America apparently prefer the west-central highlands near the Puebla state line.



Thus, twenty western migrants as against only two eastern are known in Veracruz solely from this area.

In the spring, passerines bound for western North America seldom remain in Veracruz until May and as a rule are not appreciably commoner in April than in winter. On the other hand, land birds going to eastern North America, many of which are only transients in Veracruz, nearly all postpone their departure until May 1 to 15, or even later. Moreover, in many cases they are noticeably commoner during the first third of May than in April.

The first southbound land birds, which with a very few exceptions are from eastern North America, appear in mid- or late July. Western land birds apparently do not arrive, at least in any numbers, before early September. Numerous water birds not known to nest south of the northern United States or Canada may be found in Veracruz at practically any season.

Generally speaking, migrants are very numerous not only along the Veracruz coast, but sixty miles inland along the eastern slopes of the Sierra Madre Oriental.

It is believed that the following twenty-two forms are here recorded from Veracruz in print for the first time: Richardson's Goose (*Branta h. hutchinsii*), American Widgeon (*Mareca americana*), Redhead (*Aythya americana*), Bald Eagle (*Haliaeetus leucocephalus*), Prairie Falcon (*Falco mexicanus*), Florida Common Gallinule (*Gallinula chloropus cachinnans*), Semipalmated Ringed Plover (*Charadrius hiaticula semipalmatus*), American Ruddy Turnstone (*Arenaria interpres morinella*), Hudsonian Whimbrel (*Numenius phaeopus hudsonicus*), White-rumped Sandpiper (*Erolia fuscicollis*), Stilt Sandpiper (*Micropalama himantopus*), Semipalmated Sandpiper (*Ereunetes pusillus*), Northern Black Skimmer (*Rynchops n. nigra*), Howell's Common Nighthawk (*Chordeiles minor howelli*), Acadian Flycatcher (*Empidonax virescens*), Common Bank Swallow (*Riparia r. riparia*), Desert Rough-winged Swallow (*Stelgidopteryx ruficollis psammochrous*), Western Nashville Warbler (*Vermivora ruficapilla ridgwayi*), Sonora Yellow Warbler (*Dendroica petechia sonorana*), Western Meadowlark (*Sturnella neglecta*), Eastern American Goldfinch (*Spinus tristis tristis*), and Nevada Savannah Sparrow (*Passerculus sandwichensis nevadensis*).

Evidence is presented why Veracruz should be excluded from the breeding ranges of the Lesser Cliff Swallow (*Petrochelidon pyrrhonota tachina*), Northern Purple Martin (*Progne s. subis*), and Scott's Oriole (*Icterus parisorum*).



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*Department of Biology, Centre College, Danville, Kentucky,  
January 12, 1954.*

## INVERTEBRATE NEST ASSOCIATES OF THE PRAIRIE WARBLER

BY VAL NOLAN JR.

To judge from the literature, one aspect of birds' nests that has received little attention from American ornithologists is that of the invertebrate animals to be found in them. Yet it is obvious that in addition to the possible value to the ecologist of a study of such circumscribed biotic assemblages, a species' nests should provide one of the chief sources of information concerning that bird's relations with ectoparasitic and commensal mites and insects.

During the summer of 1952, as one facet of a long-term study of the natural history of the Prairie Warbler (*Dendroica discolor*) on a 200-acre tract near Bloomington, Indiana, I attempted to collect all invertebrates from nine warbler nests. At least 20 species, 19 of them arthropods, occurred; every nest contained one or more species, seven harbored three or more, and one held seven. Three of the invertebrates are parasitic on birds, and one or more of these were present in seven of the nests. The facts that young fledged from six of these seven nests and that most lived to attain adult size are some evidence that parasitization of nestlings by the three species found does not always result in immediate death for the hosts. The circumstances of the failure of the seventh nest suggest that death of the nestlings was caused by parasites. (I have observed some 115 other nests of the Prairie Warbler, each throughout its period of active use; if parasites were present, any injurious effects on adults and young were not detected.)

The collecting was accomplished, at the suggestion of Professor Frank N. Young, through the use of the Berlese funnel. This device consists of a sheet metal, box-like receptacle about a foot square, open at the top; instead of having a conventional flat bottom, the box tapers below to form a funnel and spout. The entire instrument stands on legs which raise it so that the lower tip of the spout is a few inches above the floor. Lying flat across the plane where the sides of the box begin to constrict into the funnel, i.e., where the bottom would regularly be, is a coarse-meshed screen. On the screen is laid a piece of thin cardboard of a diameter slightly greater than that of the nest to be examined, and on this cardboard rests the inverted nest. As the nest dries, its inhabitants leave it, move on to the cardboard, and reaching its edge fall through the funnel into a container of 70 to 85 percent alcohol placed to receive them. Nests were taken immediately after the birds ceased using them and kept

in closed paper bags. Before the container of alcohol was put in place, the cardboard was inserted beneath the spout, the bag shaken vigorously over the top of the box to dislodge animals that might already have left the nest, and the cardboard placed on the screen as described. Covering the open top of the funnel prevented escape of flying insects that passed the pupal stage in the nest; equally important, it minimized the risk of accidental introduction of animals into the funnel.

While the subject of this paper is the nine nests and their invertebrate contents, such a discussion would have little meaning without a brief description of the local breeding habitat of the Prairie Warbler, its nest sites and construction materials, and the duration of the phases of its nesting cycle. This is especially true because published facts concerning the bird's life history are scanty and often do not agree with my own data.

In the hilly, unglaciated Karst terrain near Bloomington, upland plant communities not now directly affected by human use consist principally of second-growth woodland at or approaching the climax of mixed beech-maple and oak-hickory, and of eroded, abandoned fields in various stages of succession back to climax. Warbler territories are confined to the relatively open fields. In some instances trees are moderately abundant, but most are small and they never form a canopy. The tract under investigation is nearly surrounded by cultivated land or pasture; within its bounds are patches of field of from 2 to 10 acres in area, cut off from each other by bits of woods and transected by rows of trees along old fence lines. On most territories, trees are scattered at random, but in a few fields have been planted rows of black walnut (*Juglans nigra*), black locust (*Robinia Pseudo-Acacia*), and sugar maple (*Acer saccharum*), and in one, Virginia and white pines (*Pinus virginiana* and *P. Strobus*). (Plant nomenclature throughout follows Charles C. Deam, *Flora of Indiana*, Indianapolis, 1940.)

Relative frequency of trees can best be indicated by a count made on a typical Prairie Warbler territory with an area of 3.5 acres, very close to both the 1952 average and mean. Of 2263 trees, the commonest were redbud (*Cercis canadensis*), 728; sassafras (*Sassafras albidum*), 490; American elm (*Ulmus americana*), 240; flowering dogwood (*Cornus florida*), 184; shining sumac (*Rhus copallina*), 163; sugar maple, 99; black cherry (*Prunus serotina*), 88; ashes (*Fraxinus* spp.), 88; eastern red cedar (*Juniperus virginiana*), 66. Fifty percent of the trees on this territory were five feet or less in height, 90 percent 15 feet or less; many of the potentially tall trees, such as the

elm, were of low vitality and consequently were dwarfed. Principal grasses were broomsedge (*Andropogon virginicus*) and more scattered patches of purpletop (*Triodia flava*), prairie three-awn grass (*Aristida oligantha*), and Canada bluegrass (*Poa compressa*). Prominent herbs were pussytoes (*Antennaria plantaginifolia*), daisy (*Chrysanthemum Leucanthemum*), and goldenrod (*Solidago* sp.). Tangles of raspberry (*Rubus occidentalis*) and blackberries (*Rubus* spp.) were common.

Prairie Warblers place the very great majority of their nests in deciduous trees ranging in height between 3 and 25 feet. About half of the sites selected are sheltered by Virginia creeper (*Parthenocissus quinquefolia*) or grape (*Vitis vulpina*). Favored trees are sugar maple, American elm, flowering dogwood, and sassafras; but many other species are resorted to. Almost all nests are located in forks, perhaps half of them placed against the main trunk at a point where a small branch diverges. The average height of 47 nests observed in 1952 was 10.45 feet, the mode about nine feet.

The cup-shaped nest is typically made up of three parts, a bulky foundation and outer shell, an inner cup, and a thin lining. The outer shell, composed largely of the soft, cottony bast fibers of the milkweed (*Asclepias syriaca*) and fragments of the epidermal layer of the grape, is often bound together by spider webs and in July by bits from insect cocoons. Cast snake skins, particularly those of the locally common rough green snake (*Opheodrys aestivus*), are sometimes wound around the exterior of the outer shell. The inner cup is made of a substantial layer of down taken almost entirely from the fruits of broomsedge and pussytoes. The final lining is the most variable element of the nest; common materials are axes of the inflorescence of purpletop, rootlets, small feathers, and occasionally hairs of the eastern cottontail (*Sylvilagus floridanus*). One such nest after drying weighed 3.9 grams, the outer shell alone weighing 2.45 grams. Its dimensions were 62 millimeters total diameter at the top, 63 millimeters total diameter halfway between top and bottom, 43 millimeters cavity diameter at the top, 56 millimeters total height, and 35 millimeters cavity depth.

A pair of Prairie Warblers which succeeds in bring off young (one of my pairs succeeded only on the sixth nest, and five attempts are not at all unusual) uses the nest for 28 days or more from the time it is begun until the nestlings leave. Construction usually takes three days, longer if weather conditions are adverse; after building, the female remains idle at least one day. She then lays one egg on each of four successive days (occasionally there are three- and five-egg sets) and begins to incubate. Incubation lasts from 12 to 13



days; on the morning of the tenth day after the first egg hatches, all young fledge and disperse from the immediate vicinity. In most cases the nest then loses all stimulus value for the adults and they do not return to it.

The following account of the nine nests examined treats their sites, the stages attained in the nesting cycle, and the dates on which the warblers ceased to use the structures. All nests were of typical construction unless otherwise indicated.

1. Nest 2 feet 8 inches high, concealed by grape, in a four-foot redbud. Five eggs laid, all hatched. Two nestlings disappeared four days after hatching; their weights on the third day of life revealed a failure to gain at a normal rate. Remaining three nestlings found dead under nest on ninth day, June 11. Of some 100 nestling Prairie Warblers that I have studied and that have been destroyed before fledging, only one other body has been recovered. Since five maggots of the genus *Protocalliphora* were collected here, it seems possible that the parasites were the cause of death and that the parents ejected the bodies.

2. Nest 23 feet high, four feet from the trunk on horizontal limb of 40-foot hackberry (*Celtis occidentalis*). History unknown until June 26, when three young fledged.

3. Nest 2 feet 9 inches high, in witch's broom on four-foot hackberry. Four eggs laid; all hatched, and all young fledged July 4.

4. Nest 14 feet 1 inch high, fastened precariously to trunk of 20-foot black locust. Although built by same female that built nest 1, this was atypical in its shallow, saucer-like shape and in materials used. (Compare its dimensions with those previously stated: 69 millimeters total diameter at top, 55 millimeters total diameter halfway between top and bottom, 51 millimeters cavity diameter at top, 48.5 millimeters total height, and 26 millimeters cavity depth.) Outer shell almost devoid of milkweed fibers, made instead of stiff material from grape and from grasses. No appreciable inner cup; lining composed of same material as outer shell. Three eggs laid and two hatched; one nestling disappeared, and for some time nest contained unhatched egg and remaining nestling. Egg gone by July 12, when nestling fledged.

5. Nest 15 feet high in fork of 20-foot black walnut. Four eggs laid; all hatched, but young were destroyed and removed by unknown predator when nine days old, July 17.

6. Nest 19 feet above base of 24-foot flowering dogwood growing in a sink hole. Outer shell unusual in that numerous fragments of last year's sugar maple leaves were used. Four eggs laid; all hatched, and all young fledged July 26.

7. Nest 8 feet 10 inches high in 11-foot redbud. Four eggs laid; all hatched, and all young fledged July 29.

8. Nest 23 feet above base of 30-foot flowering dogwood growing in a steep ravine. Three eggs laid; two hatched, and the other remained in nest until two young fledged on July 31.

9. Nest 17 feet 4 inches high in new growth at top of black walnut. Three eggs laid; all hatched, and all young fledged August 13.

The animals collected were determined by specialists to whom they were referred by C. F. W. Muesebeck of the Division of Insect

Detection and Identification, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture. Obviously the coöperation of these men and particularly the kindness of Dr. Muesebeck were indispensable to the preparation of this paper. In addition to taxonomic information, the material that follows includes the names of determining specialists; where known, the numbers of each species identified from the various nests and the invertebrates' stages of development; and the food habits of each species, where such habits might account for its presence in the nest. For the Acarina, E. W. Baker was good enough to provide the information last mentioned; C. W. Sabrosky did the same for the fly, *Protocalliphora metallica* (Tns.). Frank N. Young gave generous advice concerning ecological relationships.

#### MOLLUSCA

##### Gastropoda (snails)

###### Pulmonata

###### Pupillidae

*Gastrocopta armifera* (Say), determined by J. E. P. Morrison. One in nest 1.  
Casual.

#### ARTHROPODA

##### Arachnida

Acarina (mites), determined by E. W. Baker.

###### Dermanyssidae

*Bdellonyssus sylviarum* Castrini and Fanzago. Two in nest 4, 13 in nest 6, 3 in nest 7, 10 in nest 9. Parasitic on the birds.

###### Phytoseiidae

*Amblyseius* sp. Two in nest 9. Predaceous, e.g., on small plant-feeding species.

###### Tarsonemidae

*Tarsonemus* sp. One in nest 4, 1 in nest 5. Fungus feeder.

###### Tydeidae

*Tydeus* sp. One in nest 5. Predaceous on small insects and mites and their eggs.

###### Trombiculidae

*Trombicula alfreddugesi* (Oudemans). Unknown numbers in nests 3 and 7.  
Parasitic on the birds.

###### Oribatulidae

*Oribatula* subgenus *Zygoribatula* sp. One in nest 1, 1 in nest 5. Relationship unknown.

###### Ceratozetidae

*Trichoribates* sp. One in nest 3. Debris or fungus feeder.

##### Insecta

###### Collembola (springtails)

Not determined. Unknown number in nest 4. Scavengers or feeders on bacteria or other microorganisms.

###### Neuroptera

Hemerobiidae (brown lacewings)

*Hemerobius* sp., determined by S. Parfin. One larva in nest 5. Predaceous on small insects.

Corrodentia (bark lice)

Liposcelidae

*Liposcelis* sp., determined by A. B. Gurney. Five adults in nest 7, 2 adults in nest 8. Scavenger on decayed animal and plant material.

Thysanoptera (thrips)

Phlaeothripidae

Haplothripinae, determined by Miss Kellie O'Neill. Two larvae in nest 5, 1 adult female in nest 8. Relationship unknown.

Hemiptera (bugs)

Anthocoridae

Genus and species not determinable, R. I. Sailer. One nymph in nest 4. Predaceous, e.g., on other insects.

Coleoptera (beetles)

Chrysomelidae

*Chlamys* sp., determined by O. L. Cartwright. One, stage unknown, in nest 5. Plant feeder.

Lepidoptera (butterflies and moths)

Tineidae

Genus and species not determinable, H. W. Capps. Twenty-two early stage larvae in nest 3, 45 early stage larvae in nest 8. Scavenger on dead or decayed animal and plant material.

Diptera (flies)

Psychodidae

*Psychoda alternata* Say, determined by A. Stone. One in nest 9. Scavenger on decaying organic material, possibly a coprophage.

*Psychoda* sp., determined by A. Stone. One in nest 3. See remarks immediately above.

Itonididae

*Clinodiplosis* sp., determined by R. H. Foote. One adult female in nest 5, 1 adult female in nest 9. Females possibly present for oviposition. Larval habits vary greatly; probably scavenger, for some larvae of this family feed on bird excrement.

Milichiidae?

Tentative determination to family by W. W. Wirth. Five larvae in nest 3. Probably plant feeders.

Calliphoridae

*Protocalliphora metallica* (Tns.), determined by C. W. Sabrosky. Ten larvae from nest 2 pupated and emerged as 6 females and 4 males. "The larvae of these flies are obligatory, blood-sucking maggots, and feed externally upon the nestlings, retiring into the nest to pupate, or dropping to the ground to do so." The Prairie Warbler is one of 54 species of birds from which this fly is recorded. (C. W. Sabrosky, *in litt.*)

*Protocalliphora* sp. probably *metallica* (Tns.), determined by W. W. Wirth. Five larvae in nest 1.

Hymenoptera

Formicidae (ants)

*Monomorium minimum* (Buckley), determined by M. R. Smith. One worker in nest 6, 1 worker in nest 7. Workers gather honeydew and secretions of extrafloral nectaries; probably casual.

*Summary.*—Invertebrates were collected in Berlese funnels from nine nests of the Prairie Warbler. All nests were built in 1952 near Bloomington, Indiana; local breeding habitat, nest sites and building materials, and duration of the nesting cycle are described. At least 20 species of animals, 19 of them arthropods, were found, and they are named to the extent that determination was possible. One nest contained one species, one nest two species, two nests three species, three nests four species, one nest five species, and one nest seven species. An attempt is made to account for the presence of the invertebrates in terms of their feeding habits. One or more of three species known to be parasitic on birds were present in seven of the nests; young fledged from six of these nests, but the death of the nestlings of the seventh may have been caused by the parasites.—

*R. R. 10, N. Fee Lane, Bloomington, Indiana, January 23, 1954.*

## IN MEMORIAM: WINSOR MARRETT TYLER

BY WENDELL TABER

WINSOR MARRETT TYLER, a Fellow of the American Ornithologists' Union, died on January 9, 1954, in his 78th year following an unfortunate accident in his own home. Born in Cambridge, Massachusetts, on April 28, 1876, the son of Daniel Gage Tyler and Mary Elvira Marrett Tyler, he attended, as did so many of his contemporaries among the old Boston families, the Noble and Greenough School, a prominent private school still in existence. At Harvard, from which he graduated in 1899, he led a quiet life with social activities limited to membership in the Golf Club.

Graduating from the Harvard Medical School in 1903, he served for two years as House Officer at the Boston City Hospital, then, after a brief respite during the summer months, became in turn Assistant House Surgeon and House Surgeon at the New York Lying-in Hospital in New York City. In the autumn of 1906, he entered the private practice of medicine in Lexington, Massachusetts. On October 22, 1910, he married Gertrude Mabel Ball, also of Lexington, who died in 1929 after divorce in 1924. A son, John Gage Tyler, of Caribou, Maine, survives.

Winsor Marrett Tyler relinquished his medical practice to become a captain in the army medical corps on May 20, 1918, and was serving as surgeon at Fort Greble, Rhode Island, when discharged on May 22, 1919. He resumed his private practice in Lexington and also acted as Medical Examiner for Middlesex County in Massachusetts. Comfortably situated financially, he retired in 1927 in order to devote the major portion of his time to ornithology. To the end, however, he remained actively in touch with his first profession through medical journals.

As a child he was imaginative and greatly interested in books containing bird or animal pictures. From this it was but a short step to a direct, energetic interest in outdoor life. Regularly while in college he would walk the 10 or more miles to his home in Lexington, absorbing nature the while. There, it was his duty to harness and exercise the family horse, a procedure which allowed of further delightful contact with nature. He soon attracted the attention of his neighbor, Walter Faxon, and from that time forward his development along ornithological lines was rapid. The instructor was good: the material was excellent.

In the medical profession he had been a far deeper student and observer of human actions than many doctors: in the field few in-

cidents of bird behavior escaped him. His approach is evident in early papers such as "A Vireo Courtship" and "The Shrike in Action" in 'Bird-Lore' in 1912, and "Notes on the Nest Life of the Brown Creeper" in 'The Auk' in 1914. The prominent associations which followed his election to the Nuttall Ornithological Club on May 3, 1909, provided further stimulus, and during the next 15 years he published many short papers and notes in 'The Auk,' 'Wilson Bulletin,' 'Oologist,' and 'Bird-Lore.' In 1917, he was elected a Member of the A.O.U., and in 1950, a Fellow.

It was only natural that papers such as the foregoing should have attracted the attention of Arthur Cleveland Bent, who encouraged him to commence writing life histories. The 37 life histories, some of them not yet published, and the "General Remarks on the Family Parulidae" prefacing the most recently issued volume, "Life Histories of North American Wood Warblers," speak for themselves. Known only to a few, though, has been the interminable delving into available ornithological literature in his own well-balanced library or at the Museum of Comparative Zoology at Harvard. Bent writes, "Dr. Tyler was my partner in producing my Life Histories and a most important helper. Without his extensive and thorough research through literature on American birds, and without the hundreds of references to pertinent matter that he sent me, I should never have attempted to make these Life Histories as nearly complete as I could. For each of my nineteen volumes, he carefully read through everything published in the many volumes of *The Auk*, *The Condor*, *The Wilson Bulletin*, *Bird-Lore*, and other important publications. I regret that I did not give him more credit for all his careful work which was so helpful. He should have been named as one of the authors."

His sympathetic understanding of people appears at its best in his memorial of Glover M. Allen in 'The Auk.' Never made public, though, were the numerous three or four page sketches about his own boyhood, his medical life and experiences, or his general penetrating observations on humanity. All unconsciously, he portrays himself in speaking of what time does *to* a man and *for* a man in his 25th college report, saying, "I hope time has changed me for the better since, twenty-five years ago, I left college, a very ignorant and a very useless boy. Do I mean that I was ignorant when I graduated? Yes, college had taught me very little, but it had given me, as it gave us all, power to learn. We know something after all these years and we are able to do some one thing well."

For many years after becoming associated with Bent, he maintained an apartment at 112 Pinckney Street at the foot of Beacon Hill in



Boston, looking out over an overgrown vacant plot of one and a quarter acres, and the Charles River. As he worked he could hear and identify from his window the numerous migrating warblers and other species. His hearing was acute and accurate right up to the time of his death. During the long winter months he read Shakespeare, year after year. "A play a day" was his motto. With the advent of spring the skill and grace of the professional baseball player invariably drew him to the ball park. A favorite spring walk was along the mile-long Esplanade to the Harvard Bridge and back, with an opportunity to see various ducks. Later, he would turn to the Boston Public Garden to observe the warbler and sparrow migrations, or stroll around Mt. Auburn Cemetery in Watertown. Frequently he would drive out to the Sudbury River Valley or ramble around his childhood haunts in Lexington. Having given up his car with the advent of the second World War and gasoline rationing, and allowed his driver's license to lapse, he passed successfully early in 1953 the necessary examination to regain his license in anticipation of driving during a forthcoming trip to Florida.

For many years Laurence B. Fletcher and he, accompanied by various other ornithologists, made a Christmas census of Cohasset and the South Shore region of Boston. Much of this trip was on foot. His final full day in the field, though, was a canoe trip after the war, in company with James Lee Peters and Joseph A. Hagar, to study the several thousand migrating Knots at the mouth of the North River in Scituate. In the last two or three years of his life, he would go from time to time of a spring or summer evening to the easily accessible marshes along the Charles River in Newton to observe the night herons, rails, and marsh wrens. On one such occasion in 1953, after watching an adult Yellow-crowned Night Heron, a species rare in this region, which was flying back and forth, he remarked, "I knew what the bird was not."

Rendered incapable of writing in recent years by a stroke which partially paralyzed his hand and left him in a generally weakened condition, his thoughts funnelled increasingly into those channels in which his particular friends were engaged, the A.O.U., Bent's Life Histories, the Nuttall Ornithological Club, and the Maine Audubon Society. He looked forward eagerly to and enjoyed attending for the first time as a Fellow an A.O.U. meeting, that of Montreal in 1951. Flying, too, was a delightful new experience. Shortly before his death, he completed rereading the entire series of Bent's Life Histories.

Quiet, sensitive, and of a rather retiring nature, he went out rarely



THE NEW YEAR'S CELEBRATION OF THE NUTTALL ORNITHOLOGICAL CLUB AT THE RESIDENCE OF C. F. BATCHELDER, JANUARY 5, 1948. In the foreground from left to right are Merton E. Cummings, Donald C. Alexander, C. F. Batchelder, and Winsor M. Tyler. In the background are Arthur W. Argue and James Lee Peters. Photograph by Nathaniel C. Nash, IV.



in public, yet was always ready to help those who came to him. He shrank from positions of prominence in front of his fellow men and avoided as much as possible heated arguments. Persons from all classes of life who did come in contact with him, however, felt quickly his personal magnetism and were strong in their appraisal of him as an outstanding personality. Peters did prevail on him to serve on the Council of the Nuttall Ornithological Club where his calm, clear understanding of human nature as well as birds proved of great value in analyzing problems and procedure. Although never actively engaged in banding, he served as a Councillor of the Northeastern Bird-banding Association, and he permitted the Massachusetts Audubon Society to carry his name as a Contributing Editor. Perhaps the greatest tribute came after his death from Charles Foster Batchelder who, approaching his own 98th birthday and recuperating from a heart attack, considered seriously attending the funeral.

*3 Mercer Circle, Cambridge, Massachusetts, April 18, 1954.*

## THE SEVENTY-SECOND STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION

BY HAROLD MAYFIELD, SECRETARY

THE Seventy-second Stated Meeting of the American Ornithologists' Union was held in the period from September 8 to 12, 1954, at Madison, Wisconsin. All sessions were held in the Memorial Union Building of the University of Wisconsin.

### BUSINESS SESSIONS

All business sessions were held on Wednesday, September 8. (1) The Council met from 9:00 A.M. through most of the day, with 19 members and five committee chairmen present. (2) The Fellows met at 4:00 P.M., with 34 Fellows present. (3) The Fellows and Elective Members met at 8:00 P.M., with 60 people present.

*Reports of Officers.* The Secretary reported that the mailing list of 'The Auk' as of September 1, 1954, contained 3234 names distributed as follows: Fellow Emeritus, 1; Honorary Fellows, 17; Corresponding Fellows, 66; Fellows, 75; Elective Members, 190; Student Members, 14; Members, 2533; Exchanges, 71; Subscriptions, 268. During the year 274 new members were added to the rolls.

The report of the Treasurer, Charles G. Sibley, will be published in a later issue of 'The Auk.' The Council voted to increase the subscription rate for 'The Auk' to \$6.00 when placed through subscription agencies but to leave the rate unchanged when the subscriber deals directly with the A.O.U.

The Editor, Robert W. Storer, reported that future issues of 'The Auk' would contain several items of unusual interest, including papers on the following subjects: the breeding biology of the Gambel's Sparrow, fat deposition in the White-throated Sparrow, the breeding biology of the Coot, North American migrants in Veracruz, life-history of one of the Tody Flycatchers, and a review paper on the ear and hearing of birds. Col. L. R. Wolfe has consented to take over the indexing of the current volumes of 'The Auk.' The next Ten-year Index may be finished by the fall of 1955.

*Reports of Committees.* Mrs. Betty Carnes, Chairman of the Committee on Endowment, presented the report of her committee. It will appear in a later issue of 'The Auk.'

During the year, A. W. Schorger, Chairman of the Committee on Biography, received notification of the deaths of 4 Fellows, 3 Corresponding Fellows, 1 Elective Member, and 15 Members.

Forty-six obituaries were published in 'The Auk' during the year. T. S. Palmer has published a volume, "Biographies of Members of the American Ornithologists' Union," in which he has collected biographies that have appeared in 'The Auk' from 1884 through No. 1 of 1954. This volume is available from the Treasurer for \$5.00 cloth-bound and \$4.00 paper-bound, the proceeds to go to the publication fund. A special vote of appreciation to Dr. Palmer was passed.

Douglas S. Miller, Chairman of the Committee on Nomination of Associates, reported that his committee had been expanded to 52 members in order to give representation to the principal population areas of the United States and Canada.

William H. Behle, Chairman of the Committee on Student Awards, reported by mail that information had been supplied to 87 individuals and institutions, and that 14 applications had been received, all of them approved. The list of recipients was published in 'The Auk' for January, 1954.

Alexander Wetmore, Chairman of the Committee on Classification and Nomenclature of North American Birds, reported that the Committee has been engaged in the preparation of the final manuscript of the Fifth Edition of the Check-List, with the help of the following men who are not members of the Committee: W. H. Behle, E. R. Blake, John Davis, Hoyes Lloyd, K. C. Parkes, and L. L. Snyder. The typing of the manuscript is being handled through the office of Frederick C. Lincoln in the U. S. Fish and Wildlife Service, and other secretarial service and cost of postage are being supplied by the Smithsonian Institution through the offices of the Chairman and Vice-Chairman. Paul H. Oehser, Chief of the Editorial Division of the Smithsonian Institution, has agreed to handle the manuscript through the press. On recommendation of the Council, the Meeting of Fellows and Members voted to authorize the use of a sum not to exceed \$15,000 for the publication of the Fifth Edition of the Check-List. During the year, the Committee considered 24 proposals for modifications in the Check-List and published 18 changes in 'The Auk' for July, 1954.

Ira N. Gabrielson presented the report of the Committee on Bird Protection. The text of this report appears on pages 110 to 112.

Frank A. Pitelka, Chairman of the Committee on Research, reported that his committee is considering (1) continuation of the listing of unpublished theses; (2) a volume on recent research; (3) a volume on biology of birds; (4) support of regional research projects, such as coordinated observation of migration; (5) assistance to the editor of the proposed Handbook.



Albert Wolfson, former Chairman of the Research Committee, reported that the volume on recent research in avian biology, previously announced, will be issued early in 1955. Advance subscriptions exceed 500, more than enough to fulfill the guarantee of the Union to the publisher.

Maurice Brooks submitted the written report of Gustav Swanson, Chairman of the Committee on Vocational Information. This report urged that vocational information be made available to people interested in birds while in high school and the undergraduate years of college. The information should point out the relatively small number of positions of a strictly ornithological nature but the large number of positions in which ornithology can be a part. Such students should be counseled to build an educational foundation in science, mathematics, and one or more foreign languages. The Committee noted at least 26 American and Canadian universities emphasizing ornithology sufficiently to permit students to conduct their thesis research in this field.

R. S. Palmer, Editor of the proposed 'Handbook of North American Birds,' reported that work on the project is progressing satisfactorily. Any royalties eventually received from this work will be used primarily for later revisions in it, or, if not required for that purpose, will be used for other publications deemed important by the Council.

*Marcia B. Tucker Student Award in Ornithology.* The sum of \$250.00, donated by Marcia B. Tucker, was awarded by vote of the officers to Robert K. Selander of the University of California to permit him to attend the annual meeting at Madison.

*Brewster Memorial Award.* The 1954 Brewster medal was awarded, by action of the Council, to James Bond for his publications on the birds of the West Indies.

*Next Stated Meeting.* The Fellows and Members accepted the invitation of several Massachusetts organizations to hold the Seventy-third Stated Meeting at Boston in 1955. Russell Mason, Chairman of the Local Committee, later informed the Secretary that the dates would be October 25 to 30, 1955.

The Council recommended that the Meeting in 1956 be held in Denver. The sponsoring group at Denver has tentatively suggested the dates of September 5 to 8, 1956.

The Secretary would welcome suggestions for 1957.

*Amendments to the By-Laws.* Two amendments to the By-Laws were adopted by the Fellows, as proposed on October 21, 1953, at Los Angeles, and published in 'The Auk' for January, 1954. These amendments have the effect of (1) changing the class of member

formerly called "Associate" to "Member," and (2) changing the class formerly called "Member" to "Elective Member." This action requires a substitution of the new titles in the following places: Art. I, Sects. 1, 6, 7; Art. II, Sects. 1, 3; Art. III, Sects. 2, 4; Art. IV. Sects. 1, 3, 4, 6, 7, 8, 9, 11, 12; Art. V. Sects. 1, 3, 5, 7.

#### ELECTION OF OFFICERS

At the Meeting of Fellows and Members, the officers of the previous year were re-elected, and three new members were elected for three-year terms to the Council (as shown on p. 77) to take the place of Dean Amadon, Harrison F. Lewis, and Olin Sewall Pettingill, Jr., whose terms expired in 1954.

The Council re-elected the Editor of 'The Auk' and the Investing Trustees.

#### ELECTION OF FELLOWS AND MEMBERS

##### FELLOWS—4

W. Earl Godfrey, Ottawa, Ontario, Canada  
Joseph J. Hickey, Madison, Wisconsin  
Howard L. Mendall, South Brewer, Maine  
Charles Vaurie, New York, N. Y.

##### HONORARY FELLOWS—2

Finn Salomonsen, Copenhagen, Denmark  
Yoshimaro Yamashina, Toyko, Japan

##### CORRESPONDING FELLOWS—4

Constantine Walter Benson, Kasama, Northern Rhodesia  
F. Bourlière, Paris, France  
Rene Verheyen, Brussels, Belgium  
Lars von Haartman, Helsinki, Finland

##### ELECTIVE MEMBERS—10

Herbert H. Beck, Lancaster, Pennsylvania  
E. Alexander Bergstrom, W. Hartford, Conn.  
Irvin Otto Buss, Menomonie, Wisconsin  
Nicholas E. Collias, Ithaca, New York  
Ernest P. Edwards, Amherst, Virginia  
Brina Kessel, College, Alaska  
Chester C. Lamb, Guanajuato, Mexico  
Louise de Kiriline Lawrence, Rotherglen, Ontario, Canada  
Henry M. Stevenson, Tallahassee, Florida  
Howard Frederick Young, Macomb, Illinois

#### ATTENDANCE

A registration fee was paid by 317 people. This group included one Honorary Fellow, 39 Fellows, 43 Elective Members, 118 Members, and 116 guests. These people represented 32 states, Alaska and the

District of Columbia, 4 provinces of Canada, and 3 other countries. People known to have been in attendance at some part of the meeting were as follows:

ALASKA—Brina Kessel.

CANADA—*Alberta*: Peter Hearne Thompson. *Manitoba*: Dr. and Mrs. Frank McKinney. *Northwest Territories*: W. A. Fuller. *Ontario*: C. H. D. Clarke, Mr. and Mrs. O. E. Devitt, Mr. and Mrs. Sidney Earle, R. D. Harris, Mr. and Mrs. Hoyes Lloyd, D. S. Miller, Mr. and Mrs. L. L. Snyder.

GERMANY—*Buldern*: Konrad Z. Lorenz. *Wilhelmshaven*: Ursula von Saint-Paul.

NEPAL—Robert L. Fleming.

SCOTLAND—Benjamin R. Feaver.

UNITED STATES—*Alabama*: O. L. Austin, Jr. *California*: Mrs. Enid Austin, John Davis, Jean Delacour, C. Lint Kenton, Dr. and Mrs. Carl Koford, Dr. and Mrs. A. H. Miller, Frank A. Pitelka, Robert K. Selander. *Colorado*: Dr. and Mrs. E. Gordon Alexander, Richard G. Beidleman, John L. Chapin, Mr. and Mrs. E. R. Kalmbach. *Connecticut*: Aretas A. Saunders. *District of Columbia*: H. G. Deignan, Allen J. Duvall, Herbert Friedmann, Ira N. Gabrielson, Dr. and Mrs. F. C. Lincoln, Alexander Wetmore. *Florida*: Mr. and Mrs. Sam Grimes, R. J. Longstreet. *Georgia*: Herbert L. Stoddard, Sr. *Illinois*: Ormsby Annan, Karl Bartel, William J. Beecher, Emmet R. Blake, Marion Clow, Dr. and Mrs. Nicholas Collias, Mrs. Harvey Davids, Paul E. Downing, Ralph M. Eiseman, Mrs. L. H. Gelatis, Mr. and Mrs. Stephen S. Gregory, Charles Hartshorne, Mr. and Mrs. John H. Helmer, Harvey I. Fisher, Lee G. Johnson, Thomas Kemper, S. Charles Kendeigh, Charles W. Kossack, Mrs. A. W. Lilly, Milton Mahlburg, Mrs. R. L. Mennette, Nelda J. McQuate, Mrs. John Morrow, Jr., Constance Nice, L. B. Nice, Margaret M. Nice, Theodore J. Nork, Paul W. Parmalee, Karl Plath, Dr. and Mrs. A. L. Rand, Dennis Sheets, Ellen Thorne Smith, Dr. and Mrs. R. M. Strong, Albert Wolfson, Howard Young, Mr. and Mrs. Albert J. Zimmerman. *Indiana*: James B. Cope, Mr. and Mrs. Raymond Grow, Robert A. Johnson, Russell E. Mumford, Val Nolan, Jr. *Iowa*: A. Lang Baily, J. H. Ennis, Dr. and Mrs. Paul L. Errington, Norwood C. Hazard, Peter Petersen, Jr., Emil Witschi. *Kansas*: H. B. Tordoff. *Kentucky*: Mr. and Mrs. Frederick W. Stamm. *Louisiana*: Dr. and Mrs. George H. Lowery, Robert J. Newman. *Maine*: Olin Sewall Pettingill, Jr. *Maryland*: Roger Tory Peterson, Chandler S. Robbins. *Massachusetts*: Mr. and Mrs. Ludlow Griscom, Joseph A. Hagar, Ernst Mayr.

*Michigan*: A. J. Berger, Laurence C. Binford, Mr. and Mrs. Ralph M. Branch, Dr. and Mrs. W. P. Cottrille, Nicholas L. Cuthbert, Robert Fleming, Jr., Dr. and Mrs. Harry W. Hann, Frank J. Hinds, Mr. and Mrs. Philip S. Humphrey, Irene F. Jorae, Mrs. Mary Spear Ross, Haven H. Spencer, Arthur E. Staebler, Robert W. Storer, Dr. and Mrs. Josselyn Van Tyne, Lawrence H. Walkinshaw, Dr. and Mrs. George J. Wallace, Mary Elizabeth Whelan, Dr. and Mrs. Leonard W. Wing. *Minnesota*: James R. Beer, W. J. Breckenridge, Mrs. Wm. F. Davidson, Jean DeBell, Beth Doeringsfeld, Dr. and Mrs. P. B. Hofslund, Mrs. H. A. Northrop, Dwain W. Warner. *Missouri*: Dr. and Mrs. William H. Elder. *Nebraska*: William F. Rapp, Jr. *Nevada*: Frank Richardson. *New Jersey*: Mrs. Herbert E. Carnes, Edward L. Chalif. *New York*: Arthur A. Allen, Elsa G. Allen, Dean Amadon, John H. Baker, Mr. Albert R. Brand, Mr. and Mrs. W. W. Brockner, Howard Cleaves, William C. Dilger, Stephen W. Eaton, Thomas E. Gilliard, David G. Greene, Edith A. Greene, James Mott Hartshorne, Mrs. Southgate Hoyt, Lois J. Hussey, Dr. and

Mrs. P. P. Kellogg, Dr. and Mrs. Heinz Meng, Martin Moynihan, Theodora Nelson, Dr. and Mrs. Ralph Palmer, Catherine M. Pessino, Richard H. Pough, Edward L. Seeber, Charles G. Sibley, Mrs. Dayton Stoner, Dr. and Mrs. Charles Vaurie, Robert G. Wolk. *North Carolina*: Merrill P. Spencer. *Ohio*: Robert E. Ball, Irving Kassoy, Harold F. Mayfield. *Pennsylvania*: Robert W. Glenn, Frederick V. Hebard, Mrs. Harold Hibbert, Kenneth C. Parkes, W. E. Clyde Todd, Dr. and Mrs. Harold B. Wood. *South Dakota*: Mr. and Mrs. Herman F. Chapman. *Tennessee*: Albert F. Ganier, Joseph C. Howell, Mrs. Amelia R. Laskey. *Texas*: Dr. and Mrs. Keith L. Dixon, Col. L. R. Wolfe. *Utah*: George A. Allen. *Vermont*: Thomas Foster. *West Virginia*: Maurice Brooks, Earl N. McCue.

*Wisconsin*: Avis Anderson, Florence Anderson, Bernice Andrews, H. Grace Baird, Clara Barger, Ruby Bere, Daniel D. Berger, Margaret S. Bergseng, Dagny Borge, Mr. and Mrs. George Brahender, Robert P. Breitenbach, Helen M. Brown, Charlotte Chamberlin, Charlotte Churchill, Bob Cook, Mr. and Mrs. David J. Cox, Catherine Oppel Crocker, Esther E. DeBoos, Mary Decker, Mr. and Mrs. George E. DeCoursey, Jr., Warren P. Dettmann, John L. Diedrich, Gilbert H. Doane, Mary F. Donald, Janet S. Ela, Robert S. Ellarson, Dr. and Mrs. John T. Emlen, Jr., Alice J. Fosse, Mr. and Mrs. G. W. Foster, C. P. Fox, Mr. and Mrs. Carl P. Frister, Rachel Gard, Mr. and Mrs. Grange Wallace, Mr. and Mrs. Frederick Greeley, Dr. and Mrs. F. N. Hamerstrom, M. S. Harding, Helen Hays, Mrs. T. S. Dillon, Dr. and Mrs. J. J. Hickey, Ruth L. Hine, Ellen Hoffman, Mr. and Mrs. Paul Hoffmann, Mr. and Mrs. Alfred O. Holz, Richard A. Hunt, Mr. and Mrs. R. P. Hussong, Zida C. Ivey, Laurence R. Jahn, S. Paul Jones, Dorothy Joslyn, Joy E. Joslyn, C. S. Jung, Mr. and Mrs. Bernard Kaiman, John L. Kaspar, Alan S. Keitt, Esther King, Mr. and Mrs. Henry Koenig, Adele Koto, Chester G. Krawczyk, Frank Kuhlman, Dorothy Young Lacey, Mr. and Mrs. W. E. Lanyon, Mrs. Aldo Leopold, Herbert W. Levi, Lillian M. Lagemann, Mrs. R. H. Lound, Florence LeTendre Lunde, David W. Lupton, Harold Mathiak, Melva Maxson, Mr. and Mrs. F. B. Mayer, Mrs. E. A. McKenna, Mrs. Eleanor B. Miles, Mrs. Lotus Simon Miller, Margarette E. Morse, Dr. and Mrs. Robert A. McCabe, Mr. and Mrs. Archie S. Mossman, Helmut C. Mueller, Charles E. Nelson, Jr., Mary H. Nelson, Robert Nero, Helen Northup, Gordon H. Orians, Ollie Owen, Gordon Paeske, Mr. and Mrs. W. A. Peirce, Eleanor Peterson, Mr. and Mrs. F. A. Potts, R. W. Poulter, James L. Quinn, Andrew R. Ragatz, Florence B. Riegel, Samuel Robbins, Mr. and Mrs. Harold D. Roberts, Dr. and Mrs. A. W. Schorger, Helen Schroeder, Mr. and Mrs. Walter E. Scott, Mrs. W. Simmons, Judge J. A. Simpson, Mrs. H. A. Skuldt, Tom Soulen, Ruth A. Stillman, Elmer W. Strehlow, Grace Swensen, Mr. and Mrs. Alvin L. Throne, Mildred Van Vonderen, Florence H. J. Vilas, Gerald A. Vogelsang, Mr. and Mrs. Fred Wagner, Russell O. Wagner, Mrs. R. A. Walker, J. Carl Welty, Keith L. White, Mrs. H. M. Williams, Harold C. Wilson, Richard G. Wilso.

#### PUBLIC SESSIONS

Papers Sessions were held in the morning and afternoon of each day beginning Thursday, September 9, and continuing through Saturday, September 11. Titles marked with an asterisk were illustrated by slides.

#### THURSDAY MORNING SESSION

Welcome by President E. B. FRED, University of Wisconsin, Madison, Wisconsin.  
Response by ALDEN H. MILLER, President, American Ornithologists' Union.

Report on the Business Meetings; announcement on the results of elections and the Brewster Memorial Award.

- \*An Analysis of House Wren Egg Characteristics. S. CHARLES KENDEIGH, University of Illinois, Urbana, Illinois.
- \*Some Results of a Five-year Banding Project of Canada Geese. ARTHUR E. STAEBLER, Michigan State College, Hickory Corners, Michigan.
- \*Nocturnal Flight-call Counts and the Hour-to-hour Pattern of Migration. ROBERT J. NEWMAN and GEORGE H. LOWERY, JR., Louisiana State University, Baton Rouge, Louisiana.
- \*Dates of Egg-laying of the European Starling in Relation to Environmental Factors, Especially Temperature. BRINA KESSEL, University of Alaska, College, Alaska.
- \*Factors Affecting Contact between Races of the Rufous-naped Cactus Wren in Southern Mexico. ROBERT K. SELANDER, University of California, Berkeley, California.

#### THURSDAY AFTERNOON SESSION

- \*The Formation of Crèches in Colonies of the Rockhopper Penguin. OLIN SEWALL PETTINGILL, JR., University of Michigan Biological Station, Cheboygan, Michigan.
- \*Remarks on the Adaptive Value of Subspecific Characters. DEAN AMADON, American Museum of Natural History, New York.
- Problems in the Preparation of a Check-list of Birds of the Palearctic Region. CHARLES VAURIE, American Museum of Natural History, New York.
- Anophthalmia (eyelessness) in the Robin. GEORGE J. WALLACE, Michigan State College, East Lansing, Michigan.
- \*The Trachea of the Sea Ducks. PHILIP S. HUMPHREY, University of Michigan, Ann Arbor, Michigan.
- \*The Nature of Cycles. LEONARD W. WING, Foundation for the Study of Cycles, Ann Arbor, Michigan.
- \*The Fossil Loon *Colymboides*. ROBERT W. STORER, University of Michigan, Ann Arbor, Michigan.
- \*Measuring Avian Habitats in Central Africa. JOHN T. EMLIN, JR., University of Wisconsin, Madison, Wisconsin.
- Comments on the Avifauna of the Sepik River and Victor Emanuel Mountains, New Guinea (motion picture). E. THOMAS GILLIARD, American Museum of Natural History, New York.

#### FRIDAY MORNING SESSION

- \*New Findings in the Life and Work of John Abbot of Georgia. ELSA G. ALLEN, Cornell University, Ithaca, New York.
- The Monotony Threshold in Singing Birds. CHARLES HARTSHORNE, University of Chicago, Chicago, Illinois.
- The Songs and Calls of the Veery. ARETAS A. SAUNDERS, Canaan, Connecticut.
- Voices of Birds of Timberline and Tundra (recording). PETER PAUL KELLOGG and ARTHUR A. ALLEN, Cornell University, Ithaca, New York.
- \*Hybridization in Birds: Occurrence, Significance, and Analysis. CHARLES G. SIBLEY, Cornell University, Ithaca, New York.
- \*Elements in the Mechanism of Breeding Cycles in Tropical Birds. ALDEN H. MILLER, University of California, Berkeley, California.
- \*The Measurement of Kinetics in the Avian Skull. HARVEY I. FISHER and DONALD C. GOODMAN, University of Illinois, Urbana, Illinois.

Factors Influencing Ecologic Distribution of the Brown and Spotted Towhees.

JOHN DAVIS, Hastings Reservation, Carmel Valley, California.

\*Breeding Season in Relation to Insect Abundance Near Point Barrow, Alaska.

FRANK A. PYTELKA, University of California, Berkeley, California.

FRIDAY AFTERNOON SESSION

\*Iridescence in Feathers. R. M. STRONG, Chicago Natural History Museum, Chicago, Illinois.

SYMPOSIUM ON BIRD BEHAVIOR

Moderator: JOHN T. EMLEN, JR.

Some Aspects of Hostile Behavior in Gulls. MARTIN MOYNIHAN, Cornell University, Ithaca, New York.

An Analysis of the Display Movements of the Eider. D. FRANK MCKINNEY, Delta Waterfowl Research Station, Delta, Manitoba.

Observations on Family Integration in Ducks. NICHOLAS E. COLLIAS and ELSIE C. COLLIAS, Illinois College, Jacksonville, Illinois.

The Problem of Ritualization (Motion Picture). KONRAD Z. LORENZ, The Max-Planck-Institut für Ethologie, Bielefeld, Westfalen, Germany.

SATURDAY MORNING SESSION

SYMPOSIUM ON HOW THE AMATEUR CAN CONTRIBUTE  
TO ORNITHOLOGICAL SCIENCE

Moderator: JOHN DAVIS

Life History Studies. CARL KOFORD, University of California, Berkeley, California.

Bird Population Studies. CHANDLER S. ROBBINS, Patuxent Research Refuge, Laurel, Maryland.

Sight Records. LUDLOW GRISCOM, Harvard University, Cambridge, Massachusetts.

\*The Nature of Changes in Bird Populations. JOSEPH C. HOWELL, University of Tennessee, Knoxville, Tennessee.

\*A Bird Population Survey Method. A. LANG BAILY, Davenport Public Museum, Davenport, Iowa, and JOHN L. CHAPIN, University of Colorado Medical School, Denver, Colorado.

Development of Behavior in Three Rails. MARGARET M. NICE, 5725 Harper Ave., Chicago, Illinois.

\*The Use of Sound Recordings in Censusing and Studying Birds (recording). PETER PAUL KELLOGG, Cornell University, Ithaca, New York.

\*A Strange Jay from the Isthmus of Tehuantepec. FRANK A. PYTELKA and ROBERT K. SELANDER, University of California, Berkeley, California and MIGUEL ALVAREZ DEL TORO, Instituto Zoologico, Tuxtla Gutierrez, Chiapas, Mexico.

SATURDAY AFTERNOON SESSION

\*Winter Species Association Groups Among Birds. RICHARD G. BEIDLEMAN, Colorado Agricultural and Mechanical College, Fort Collins, Colorado.

\*Some Observations on Territorial Behavior of the Carolina Chickadee. KEITH L. DIXON, Agricultural and Mechanical College of Texas, College Station, Texas.

Cowbird Parasitism of the Northern Yellowthroat. PERSHING B. HOFSLUND, University of Minnesota, Duluth, Minnesota.

\*The Vulture Problem in Texas. PAUL W. PARMALEE, Illinois State Museum, Springfield, Illinois.



The Cooper's Hawk. (Motion Picture) HEINZ MENG, State University of New York, New Paltz, New York.

Churchill Revisited (Motion Picture). ARTHUR A. ALLEN, Cornell University, Ithaca, New York.

Birds of the Bering Sea. (Motion Picture). ROGER TORY PETERSON, Glen Echo, Maryland.

#### GENERAL EXHIBITS

The original paintings by Owen J. Gromme for *The Birds of Wisconsin* were exhibited in the Union Library. Here also the engraving plates for this work were shown, and on Thursday evening Richard A. Shilbauer of the Mueller Engraving Company explained technical aspects of the engraving process.

Specimens of hybrid birds, oils by staff members of the Milwaukee Public Museum, and archaeological artifacts of interest to ornithologists were on display in the Main Lounge.

In the Men's Lounge there were three displays: bird books available through the Wisconsin Society of Ornithology; ornithological works published by university presses, arranged by the University of Wisconsin Press; and ornithological miscellanies exhibited by Mrs. Herbert E. Carnes.

In the halls there were black-and-white pictures of birds by Wisconsin photographers, ornithological bookplates, and kodachrome slides displayed by automatic projectors supplied by the Wisconsin Conservation Department.

Rare bird books and ornate examples of ornithological illustration were made available for inspection in the Rare Book Room of the Memorial Library.

#### OTHER EVENTS

On Wednesday evening a dinner was given for the Fellows and Council by the Local Committee in the Round Table Room. Following the dinner period, all members and guests were invited to after-dinner coffee in the Main Lounge.

On Thursday evening, members and guests were invited to a reception in the Main Lounge as guests of the Wisconsin Society for Ornithology and the Madison Audubon Society. Later in the evening a portrait of Aldo Leopold was unveiled and presented to the University by Mrs. Leopold and former students of the late Professor Leopold.

On Friday evening a special display showing the fall plumages of local birds was available for viewing in the Main Lounge. In the Play Circle Theater two moving pictures in color were shown: Jean Delacour presented "Ornithology in the Los Angeles County Museum"; and Frederick C. Lincoln presented "Whooping Cranes."

Nearly 300 people attended the annual banquet on Saturday evening and heard an address with color slides by Olin Sewall Pettingill, Jr., entitled "Five Months in the Falkland Islands."

A short field trip to the University of Wisconsin Arboretum was offered before breakfast on Saturday morning. An all-day field trip on Saturday carried visitors to the Horicon Marsh area some 50 miles northeast of Madison.

#### RESOLUTIONS

WHEREAS, The total population of the Ross's Goose is believed to be about 4000 birds, and

WHEREAS, It is known that each year many of these geese are killed either by accident or intent, the total loss during the 1953 hunting season being in excess of 1000, and

WHEREAS, The Ross's Goose winters almost entirely in the Sutter Buttes area in California in which the Sacramento National Wildlife Refuge is located, therefore be it

*Resolved*, That the American Ornithologists' Union at its 72d Stated Meeting, held at Madison, Wisconsin, does hereby commend the United States Fish and Wildlife Service and its Director, Colonel John L. Farley, for resisting pressure in California to open any part of the Sacramento National Wildlife Refuge to sport hunting, and be it further

*Resolved*, That the American Ornithologists' Union pledges its support to the Fish and Wildlife Service to maintain the Sacramento National Wildlife Refuge inviolate for all time, and be it further

*Resolved*, That a copy of this Resolution be sent to Colonel John L. Farley, Director of the Fish and Wildlife Service.

WHEREAS, We, members of The American Ornithologists' Union, are about to adjourn the Seventy-second Stated Meeting, our first official gathering in Wisconsin; therefore be it

*Resolved*, That we extend to the members of the Local Committee on Arrangements, namely:

A. W. Schorger, *General Chairman*

John T. Emlen, Jr.

John L. Kaspar

James H. Zimmerman

Walter E. Scott

Gilbert H. Doane

Robert W. Nero

Robert Norris

G. W. Foster, Jr.

Miss Ruth L. Hine

James A. Larsen

Clay Schoenfeld

Mrs. Walter E. Scott

Mrs. Frederick Greeley

Miss Helen Northup

Joseph J. Hickey

W. E. Lanyon

Laurence R. Jahn  
Harold Mathiak  
Frederic H. Wagner  
Robert A. McCabe  
Robert S. Ellarson  
James B. Hale  
Mrs. Joseph J. Hickey

Richard R. Bond  
Frederick Greeley  
Mrs. A. W. Schorger  
Mrs. Eleanor B. Miles  
Mrs. Robert A. McCabe  
Mrs. Gilbert Doane  
Mrs. Aldo Leopold

Mrs. John Emlen

the deep appreciation and gratitude of the Union for their tireless efforts in preparing for this highly successful meeting, for their efficient direction and patient attention to details, and for their many personal kindnesses; and be it further

*Resolved*, That we express the thanks of the Union to the University of Wisconsin for the use of its superb facilities in the Memorial Union Building and to President E. B. Fred and Vice-President Ira L. Baldwin of the University for various courtesies extended.

*Be It Finally Resolved*, That we express the sincere thanks of the Union to the Kumlien Club, the Madison Audubon Society, and the Wisconsin Society for Ornithology for their very pleasant social arrangements and warm hospitality, to the Milwaukee Public Museum for the splendid art exhibit, and to the Wisconsin Conservation Department for the fine kodachrome exhibits.

## OFFICERS, TRUSTEES, AND COMMITTEES OF THE AMERICAN ORNITHOLOGISTS' UNION

### Expiration of Term

Alden H. Miller, <i>President</i> .....	1955
Ludlow Griscom, <i>First Vice-President</i> .....	1955
Ernst Mayr, <i>Second Vice-President</i> .....	1955
Harold Mayfield, <i>Secretary</i> .....	1955
Charles G. Sibley, <i>Treasurer</i> .....	1955
Robert W. Storer, <i>Editor of 'The Auk'</i> .....	1955

### ELECTIVE MEMBERS OF THE COUNCIL

Jean Delacour.....	1955
Harvey I. Fisher.....	1955
Herbert L. Stoddard.....	1955
John T. Emlen, Jr.....	1956
A. W. Schorger.....	1956
Albert Wolfson.....	1956
Ira N. Gabrielson.....	1957
George H. Lowery, Jr.....	1957
Roger Tory Peterson.....	1957
Thomas R. Howell, <i>Cooper Ornithological Society Representative</i> .....	1955
Maurice Graham Brooks, <i>Wilson Ornithological Club Representative</i> .....	1955
Arthur Cleveland Bent, 1935-37.....	} <i>Ex-Presidents</i>
James P. Chapin, 1939-42.....	
Herbert Friedmann, 1937-39.....	
Hoyes Lloyd, 1945-48.....	
Robert Cushman Murphy, 1948-50.....	
Josselyn Van Tyne, 1950-53.....	}
Alexander Wetmore, 1926-29.....	

### INVESTING TRUSTEES

Frederick V. Hebard, <i>Chairman</i> .....	1955
G. Ruhland Rebmann, Jr.....	1955
Phillips B. Street.....	1955

### COMMITTEES

COMMITTEE ON FINANCE. Charles G. Sibley, *Chairman*. Ludlow Griscom, Harold Mayfield, Ernst Mayr, Alden H. Miller, Burt L. Monroe.

COMMITTEE ON ENDOWMENT. Betty Carnes (Mrs. Herbert E.), *Chairman*. (Membership to be announced later.)

COMMITTEE ON PUBLICATIONS. The Editor of 'The Auk' (Robert W. Storer), *Chairman*. The President, the Secretary, the Treasurer, the Editor of 'The Ten-Year Index to The Auk' (Charles K. Nichols), Dean Amadon.

COMMITTEE ON COMMUNICATIONS. Harold Mayfield, *Chairman*. Andrew J. Berger, Raymond A. Paynter, Jr.

EDITORIAL COMMITTEE. Robert W. Storer, *Chairman*. Andrew J. Berger, William R. Dawson, John T. Emlen, Jr., Harvey I. Fisher, Philip S. Humphrey, Frank McKinney, Peter Stettenheim, Col. L. R. Wolfe.

COMMITTEE ON THE BREWSTER MEMORIAL AWARD. Herbert Friedmann, *Chairman*. Hildegarde Howard, S. Charles Kendeigh, Roger T. Peterson, Robert W. Storer.

COMMITTEE ON BIOGRAPHY. A. W. Schorger, *Chairman*. Jean Delacour, Hildgarde Howard, Stanley G. Jewett, T. S. Palmer, J. Murray Spiers, Wendell Taber.

COMMITTEE ON NOMINATION OF FELLOWS AND ELECTIVE MEMBERS. George H. Lowery, Jr., *Chairman*. John T. Emlen, Jr., Harvey I. Fisher.

COMMITTEE ON NOMINATION OF HONORARY AND CORRESPONDING FELLOWS. Josselyn Van Tyne, *Chairman*. Jean Delacour, Ernst Mayr.

COMMITTEE ON NOMINATION OF MEMBERS. Douglas S. Miller, *Chairman*. (Membership to be announced later.)

COMMITTEE ON CLASSIFICATION AND NOMENCLATURE OF NORTH AMERICAN BIRDS. Alexander Wetmore, *Chairman*. Herbert Friedmann, *Vice-Chairman*. Dean Amadon, Frederick C. Lincoln, George H. Lowery, Jr., Alden H. Miller, Frank A. Pitelka, Josselyn Van Tyne, John T. Zimmer.

COMMITTEE ON RESEARCH. Frank A. Pitelka, *Chairman*. George A. Bartholomew, Jr., Herbert G. Deignan, John T. Emlen, Jr., Donald S. Farner, Harvey I. Fisher, Ernst Mayr, Robert Cushman Murphy.

COMMITTEE ON BIRD PROTECTION. Ira N. Gabrielson, *Chairman*. Jean Delacour, Ludlow Griscom, Hoyes Lloyd, Roger T. Peterson.

COMMITTEE ON STUDENT AWARDS. William H. Behle, *Chairman*. Joseph C. Howell, Thomas R. Howell, Raymond A. Paynter, Jr., William Rapp.

COMMITTEE ON VOCATIONAL INFORMATION. Gustav A. Swanson, *Chairman*. Maurice Brooks, Ira N. Gabrielson, George H. Lowery, Jr., Harrison B. Tordoff, Albert Wolfson.

LOCAL COMMITTEE ON ARRANGEMENTS FOR THE SEVENTY-THIRD STATED MEETING. C. Russell Mason, *Chairman*. (Membership to be announced later.)

## GENERAL NOTES

**Birds in the Upper Arctic.**—Although there have been few observers in the northernmost Arctic, it is generally assumed that the region about the Pole is devoid of life, with the exception of that which occurs in the open patches of sea, and an occasional bear or fox. Recently, however, a United States Air Force research party recorded birds on a number of occasions while drifting on a huge ice cake, known as "T-3" or "Fletcher's Ice Island," within 150 miles of the Pole.

It is at the request of the scientific personnel of the U.S.A.F. Cambridge Research Center, who were making geophysical studies on T-3, that I am privileged to place on record these interesting and important observations. I am indebted to Miss Vivian Bushnell, of the Cambridge Research Center, for providing several references to earlier records and for other assistance.

A description of Fletcher's Ice Island, and the course through which it has drifted, may be found in Cray, Cotell, and Sexton (Arctic, 5: 211-223, 1952) and in Fletcher (Nat'l Geog. Mag. 103: 489-504, 1953). In brief, the island is 31 miles in circumference and it is composed of fresh water ice which appears to have broken off a glacial shelf at Ellesmere Island many years ago. Scattered irregularly over the rough surface and contributing to the impression that it is a stationary ice-covered island, are rocks, gravel, and dirt. In a limited region near the edge there are deposits of broken bits of plant material such as twigs and roots. There appears to be, however, nothing edible for land birds, although open leads are sources of food for marine birds.

From June 12 to August 15, 1952, the research party sighted single birds on eight occasions between the extremes of 88° 01' N and 88° 30' N, and 91° 00' W and 122° 00' W. Unfortunately, none of the research party was proficient in identifying birds and all were described as being "sea gulls," with the exception of one on June 12, which Mr. Robert D. Cotell believes, after having examined museum specimens, to have been a jaeger.

From May 6 to September 19, 1953, birds were noted 15 times, between 85° 15' N and 86° 10' N, and 75° 00' W and 96° 00' W. Ten of the observations were of small birds described as being largely white and flying with pronounced undulations. With additional information concerning their calls and tracing of their footprints, there is little doubt that these were Snow Buntings (*Plectrophenax nivalis*). On one occasion there were four in a flock and on another two; the remaining birds were seen singly. Five large birds were also observed singly; four were described as gull-like and the fifth, which was collected by Mr. Albert P. Cray on September 19, at 86° 08' N, 75° 00' W, is an immature Kittiwake (*Rissa tridactyla* subsp.), which is deposited in the Museum of Comparative Zoology. There is no known record of a bird having been collected farther north.

According to Fisher (The Fulmar, 1952) the northernmost locality at which birds have been seen is at 86° 35' N, 44° 48' E, the point at which an observer on board the drifting Russian icebreaker *Sedov* noted *Fulmarus glacialis* in September, 1939. An account which was apparently overlooked by Fisher, or not believed to be reliable, is that by Papanin (Life on an Icefloe, 1947), who, starting near the Pole, drifted southward for ten months on an icefloe. He said (p. 133) "Shortly after our arrival at the North Pole we could hardly believe our own ears when we heard the chirping of birds. Then we saw a snow bunting . . . Later, however, we were visited by seagulls, fulmars, guillemots and many other birds." Papanin also reported (Trudy Dreifuushehei Stantsii "Severnyi Polius" [= Trans. of the Drifting Station "North Pole"], Izdatel'stvo Glavsevmorputi, 1: 55, 1940) "we encountered the snow bunting,



guillemot, fulmar and kittiwake from the very first days of our life on the floe." Bunynitsky, who was on board the *Sedov*, and who was the source of Fisher's information, has also remarked (*Comptes Rendus*, 27: 122-127, 1940) that "it is curious to note that we fell in several times with the *P. nivalis* beyond the 86th parallel. The appearance of these birds either coincided with or followed a strong gale. The birds were always greatly exhausted. . . ."

Thus, from these shreds of information it seems that the high Arctic is probably not quite so desolate as one might suppose. We have yet to learn, however, the source of the birds, whether they normally frequent such high latitudes, what their feeding habits are, and the answers to many other questions.—RAYMOND A. PAYNTER, JR. *Museum of Comparative Zoology, Cambridge 38, Massachusetts.*

**Pine and Yellow-throated warblers Feeding on the White Pine Scale Insect.**—On December 17, 1950, Mr. William R. Solomon and I found a Pine Warbler (*Dendroica pinus*) in a small, dense grove of White Pine (*Pinus strobus*) and Scotch Pine (*Pinus sylvestris*) located within the boundaries of the Split Rock Golf Course, Pelham Bay Park, Bronx County, New York.

After observing and identifying the bird, we noticed that it was rubbing its bill along and among the needles of the White Pine. After collecting some needles, we found small white splotches irregularly scattered along them. Professor Herman T. Spieth of the City College of New York kindly identified these white forms as those made by the wintering stage of the White Pine Scale Insect (*Chionaspis pinifoliae*).

The Pine Warbler was observed during the following two weeks and was found still feeding in the same manner. Although the White Pine Scale Insect occurred on both (*P. strobus* and *P. sylvestris*), the Pine Warbler was never seen feeding in the Scotch Pines.

Mr. Solomon and I revisited the Pine Grove on April 28, 1951, and were fortunate enough to find and observe a Yellow-throated Warbler (*Dendroica dominica*). The bird was observed for three and a half hours and was only seen feeding in the Scotch Pine (*Pinus sylvestris*). It acted and fed in a manner similar to that of the Pine Warbler. While the Yellow-throated Warbler was under observation, I believe it fed continually on this scale insect. Although neither bird was collected and the stomach contents of the warblers were not examined, I would say that this scale insect (*Chionaspis pinifoliae*) must have constituted the major source of food for the birds while they were observed in the pine grove.—MAURICE L. RUSSAK, 1675 Metropolitan Avenue, New York 62, New York.

**A Mixed Clutch of Ruffed Grouse and Ring-necked Pheasant Eggs Hatch on the Same Day.**—On the south side of a poplar-wooded hill at Midland, Michigan, May 5, 1953, a Ruffed Grouse (*Bonasa umbellus*) was accidentally flushed from a ground nest containing 19 eggs. There appeared to be two colors and sizes of eggs. By good fortune, it was possible to see the eggs hatching on June 3.

By 12:30 p.m. of that day, four Ring-necked Pheasant chicks (*Phasianus colchicus*) had hatched. The adult Ruffed Grouse then left the nest with these chicks and apparently did not return. Between 1:00 and 6:30 p.m. one more pheasant and three Ruffed Grouse chicks hatched. These chicks and the remaining eggs were collected at 5:30 p.m. and incubated. By back-checking on color photographs of the types of eggs and the young which hatched from them, it was determined that there were six pheasant eggs and thirteen Ruffed Grouse eggs in the nest on May 5. (Dr. Miles Pirnie of Michigan State College kindly identified the chicks, since the authors had no previous experience in separating the very young of these species.)

On June 4, the remaining eleven unhatched eggs were opened for examination of the contents. Two eggs contained fully formed dead chicks, another had been punctured by a bird's claw and was empty, another contained enough gas to blow up, and the remaining seven eggs were partially filled with solid yolk-like material or filled with liquid containing no noticeable embryos.

An observation of the speed and manner of hatching of a Ruffed Grouse egg was made. The egg was one and nine-sixteenths inches long. At 1:00 p.m., the bird made a hole about three-eighths of an inch from the tip of the large end of the egg. At 2:00 p.m. this had enlarged to a squarish hole one-quarter inch in diameter. The bird began to crack the egg by making bumps at one-quarter- to one-half-inch intervals, and after each bump, the intervening shell would crack. This continued in a circular pattern going clockwise, looking from the small end of the egg. By 3:00 p.m. the egg was cracked half-way around, and at 3:10 p.m. the bird broke out of its shell by cracking most of the remaining half of the shell in one push. The cracking appeared to be accomplished by turning only the head, while the body of the chick remained stationary.

It was found that the young pheasants and Ruffed Grouse preferred insects to grain (chicken mash), at least for the first week or more. They ate field-caught insects such as hairless caterpillars, adult moths and butterflies, mosquitoes and other flies, spiders, and plant bugs, especially mirids. They cared less for earthworms, ants, and hairy caterpillars and would not eat tent caterpillars, stink bugs, and hard, adult beetles.—E. E. KENAGA, M. A. WOLF, and A. E. DOTY, *Midland, Michigan*.

**A Western North Atlantic Record for the Frigate Petrel (*Pelagodroma marina hypoleuca*).**—A Frigate Petrel or White-faced Storm Petrel (*Pelagodroma marina*) was noted by the writer in a group of Wilson's Petrels (*Oceanites oceanicus*) approximately 60 miles SSE of Block Island, Rhode Island, at about 11:00 A.M. on August 18, 1953. The specimen was collected by Dr. Richard H. Backus, of the Woods Hole Oceanographic Institution, at about 12:00 noon (ship's position at this time 39° 48' N., 71° 02' W.). The bird was photographed and preserved in formalin and has since been presented to the American Museum of Natural History.

Dr. Robert C. Murphy of the American Museum has very kindly measured the bird and identified it subspecifically. His conclusions are as follows (*in litt.*): "Comparison and measurements show that this specimen is typical of the eastern North Atlantic or Cape Verde Island race (*P. m. hypoleuca*). . . . Weight, after removal from formalin, 56.4 gm.; wing expanse 414 mm.; wing 158 mm.; tail 70.6 mm.; culmen 19.4 mm.; tarsus 44.4 mm.; toe and claw 36.9 mm." Further information on the species may be found in Murphy and Irving (*Amer. Mus. Novit.*, No. 1506: 17 pp., 1951).

Reference to the four editions, and all supplements, of the A.O.U. Check-list has revealed only one other western North Atlantic record for this species (and subspecies)—400 miles off the coast of New Jersey (40° 34' 18" N., 66° 09' W.), September 2, 1885, by Robert Ridgway.

This record has also brought up a minor problem, namely, how are the offshore limits of the Check-List area constituted? No defining statements in this regard have been found in any of the material referred to.

To remedy this situation, the following is suggested: no natural hydrographic boundary that would hold for all coasts of North America being available, it is proposed that only those birds collected between a line on the sea-surface corresponding to the 1000-fathom contour of water depth and shore be included in the Check-List. The 1000-fathom curve is generally very near the point at which the continen-

tal slopes end and the deep ocean basins begin, hence is a good indicator of the physical boundaries of the continent.

On this basis, the present record is the first for *Pelagodroma marina* for the Check-List area, Ridgway's specimen having been taken beyond the 1000-fathom contour.

The writer's thanks are due Commander David C. Nutt, USNR, owner and master of the *Blue Dolphin* (the research vessel from which the observation was made), for having made the writer's presence on the vessel possible. Dr. Charles G. Sibley and Messrs. Walter Bock, William C. Dilger, Richard E. Harrison, John T. Nichols, and Richard H. Pough have all very kindly given their opinions in regard to the above definition.—MALCOLM S. GORDON, *Department of Conservation, Cornell University, Ithaca, New York.*

**Sandhill Cranes in Yellowstone Park.**—The distribution records for the Greater Sandhill Crane (*Grus canadensis tabida*) as outlined by Walkinshaw (The Sandhill Cranes, 1949, Cranbrook Inst. of Science Bull. 29), include five observations in Yellowstone National Park, Wyoming. These were recorded during the period 1925 through 1941. Observations made during the summer of 1953 in conjunction with a research project approved by the National Park Service indicate that this bird may be using that wildlife sanctuary as a nesting ground to an extent greater than is generally known.

**Census.**—The area surveyed is that portion of Hayden Valley, Yellowstone Park, which is inclosed between the Yellowstone River and the park highway connecting Canyon Junction to Dragon's Mouth Spring. This seven-mile strip does not exceed three-quarters of a mile in width, is generally treeless, and supports a vegetative cover of sagebrush on the knolls and sedge-rush in the lowlands. Elevation is approximately 7750 feet. Late afternoon counts were made from nine good vantage points along the highway. Six counts were made on separate days between May 29 and June 21, and the numbers of these birds observed per day were four, seven, five, eight, nine, eight. These were seen singly or in pairs from five of the vantage points; cranes were not seen from the other four points. Park records of 1953 indicate that the Sandhill Crane was also resident in the meadows bordering Fairy Creek, Sentinel Creek, Nez Perce Creek, and in the Fountain Flats area. In addition, they were reported from Gibbon Meadows, the Nymph-Twin Lake area, and Elk Park, all within Yellowstone Park.

**Nesting.**—Two crane nests were discovered on May 31, in the Hayden Valley study plot. Both were located in river-front marshes which supported a luxuriant growth of rushes, and these plants were the only building material utilized. One nest had base diameters of  $95 \times 106$  cm., top diameters of  $77 \times 83$  cm., and was cupped 2 cm. The height above water level was 17 cm.; the water depth, 5 cm. Both nests contained two smooth, ovate, olive-colored eggs on which lavender spots were so concentrated at the larger ends as to form nearly complete caps. Measurements of two eggs from the same nest averaged  $60.2 \times 92.7$  mm., conforming closely to the averages of those measurements recorded for this subspecies by Walkinshaw (1949) in Michigan and Canada. No egg weights were taken. On June 1 one of the nests was found empty, and no clue could be found which might suggest the fate of the eggs. Hatching dates of the eggs in the other nest were June 7 and June 9.

**Defensive Behavior.**—The behavior patterns exhibited by one of these pairs' of cranes, when alarmed, were so at variance with those described by Walkinshaw (1949) in his extensive study that some pertinent description seems worthwhile. It is probable that the frequency of my almost daily visits somewhat modified their reactions, particularly since I always approached rather slowly over the same route.

Following the discovery, when the nesting bird was flushed at a distance of seven meters, the behavior of the birds during my intrusions became almost routine. As I appeared, about seventy meters distant, the incubating bird lowered its head and neck from the alert upright position until they lay forward along the outside of the nest with the head resting on the surface of the water. When I was approximately fifty meters away, the bird arose slowly from the nest and walked silently toward me. When it was some twenty meters from the nest, it sounded an alarm call which was answered immediately by the mate which was feeding nearby, and it, too, then walked rapidly toward me. While they advanced, both birds called, quivered their half-stretched wings, splashed water by stamping their feet, and picked large beakfuls of rushes which they shook violently and then discarded. When within twenty meters of me, they swung out of the line of my approach and then followed me to the nest. They shortened the distance between us, as they followed, and increased the tempo of their alarm call. They watched silently while I briefly examined the nest, then, as I left, they again followed me and resumed the call and the acrobatics previously described. When I was about thirty meters from the nest, one bird hastened back to it, while the other stopped following me but continued to call as long as I remained in sight. Variations of this pattern seemed largely dependent upon weather conditions; once, during a brief snowstorm, the incubating bird walked seven meters from the nest, watched silently as I measured an egg, and returned to incubate before I had retraced thirty paces.

A similar behavior pattern was exhibited by the newly-hatched chicks. When less than a full day old, both simply squatted in the nest as the adult sounded the first alarm call from a distance of about twenty meters. When more than a day old, however, the young scurried immediately into the surrounding rushes as the adult quietly walked away.

Both chicks were brooded in the nest during the night of June 10; this was the fourth night of occupancy for the older chick. By sunset on June 11, the new family had moved to higher ground some eighty meters distant, and it is probable that they had abandoned the nest.

Too few observations were made on the foraging of this family to discover a detailed pattern of defensive behavior, if any, under those circumstances. During visits on June 12, 19, and 21, however, it became apparent that the bold aggressiveness which characterized the adults during the nesting period had changed to a timid wariness while they cared for their young. They were constantly alert and either outdistanced me when I approached from afar, or hid when I came into view nearby. In the latter case, when flushed, they flopped about on the ground, with wings outstretched, mandibles agape, and they voiced a previously unheard moaning call. The young birds remained hidden during this effective distraction.

The group remained in the nesting marsh until mid-July. It is probable that the increased incidence of fishermen along the river front then induced these cranes to seek a more secluded area.—JAMES W. CASLICK, *Newfield, N. Y.*

**A Case of Cannibalism by a Captive Tufted Titmouse (*Parus bicolor*).—**Cannibalism is not a particularly unusual nor a surprising event in the case of raptorial birds. However, for a small insectivorous bird to eat the flesh of another individual of its own species when the body of the victim is almost entirely intact would seem sufficiently unusual to be worthy of record.

Shortly after sunset on October 27, 1953, two Tufted Titmice were taken from a banding trap and placed in a large outdoor cage adjacent to the Ornithological Laboratory at Ohio State University. The birds were left in the cage which had been

used to remove them from the trap, but the door of the small cage was left open so that they could readily move from the small cage into the larger one. Food and water were available in the large cage.

When I arrived at the scene the following morning, only one of the Tufted Titmice was to be found flying about. Careful search revealed the fact that a Norway Rat or a weasel had gained entrance into the cage during the night and had killed one of the birds. The body of the dead bird was dragged into a small hole at the corner of the cage where the mammal predator had entered. The bird's brain and abdominal viscera had been removed by the mammal. After examining the bird, I threw it on the ground and proceeded to repair the cage to prevent further damage by the mammal predator.

As soon as I had stepped out of the cage and closed the door, the remaining Tufted Titmouse flew to the ground and proceeded to peck at the flesh of the dead bird through the opening in the body cavity which the mammal had made. This behavior continued for some ten minutes while I stood about twelve feet away and watched. I then closely reexamined the dead bird and found that the live titmouse had eaten considerable flesh from the wall of the body cavity and had removed most of the muscles from one femur.

While the appearance of this dead bird was somewhat different from what it had been in life, most of the feathers of the body were still intact. The opening which the mammal predator had made into the body cavity of the dead titmouse lay exposed when the second titmouse commenced to eat the flesh of the first.—PAUL A. STEWART, *Department of Zoology and Entomology, Ohio State University, Columbus 10, Ohio.*

**Bronzed Grackle (*Quiscalus quiscula versicolor*) nesting on Beaver Lodge.**—Grackles of the genus *Quiscalus* are well known for versatility in their choice of nesting sites. Further evidence of this adaptability was revealed by the discovery of a grackle nest among the sticks of an occupied beaver lodge in Algonquin Provincial Park, Ontario. On June 6, 1951, this nest contained young about six days old. Its rim was about twenty inches above the water and slightly below the top of the more steeply-sloping part of the side of the dome-shaped lodge. It was on the south side and was visible from the highway along the shore about sixty feet away.

As many as three beavers were seen at one time swimming within a few yards of the grackle on her nest. Beavers and grackles seemed to ignore each other. There appeared to be little chance of the beavers disturbing the nest: only one stick looked fresh enough to have been added to the exterior of the lodge within recent weeks, and this was on the opposite side from the nest.

This same beaver pond, a flooded black spruce-leatherleaf bog, supported several other pairs of grackles whose nests were within a few inches of the water. Some were in dead vegetation, some in living. What one might have judged to be more typical sites several feet above the water were neglected in favor of those so low that in at least one instance the exterior bottom of a nest containing young was in water. In one case, however, a nest was seven feet up in a hollow stub standing in the water.

Observations with a 37-power telescope showed that the young in all nests on June 6 were being fed largely on dragon fly nymphs.—HAROLD H. AXTELL, *Buffalo Museum of Science, Buffalo, New York.*

**The Prothonotary Warbler in Surinam.**—According to Hellmayr (Cat. Birds Americas, pt. 8: 334, 1935), the winter range of the Prothonotary Warbler (*Protonotaria citrea*) lies in Nicaragua, Costa Rica, Panama, northern Colombia,

western Ecuador, Venezuela, and Trinidad. A search in the Zoological Record revealed no records south or east of this area.

On January 22, 1954, I collected a Prothonotary Warbler of undeterminable sex in the mangroves bordering the mouth of the Corentyne River, Nickerie District, Surinam. The specimen, bearing my field number 1600, is now in the American Museum of Natural History, New York. This record extends the known winter range of this species considerably to the east.—F. HAVERSCHMIDT, P. O. Box 644, Paramaribo, Surinam.

**Ruptured Heart in the Cardinal (*Richmondena cardinalis*).**—On May 26, 1953, Dr. Arthur A. Allen brought an adult male Cardinal to me for preparation. Its death was attended by rather interesting circumstances. Another male had contested its territory and intermittent fighting had taken place for about a day when the presumed resident male was discovered under some brush. The bird was apparently exhausted and was taken into the house where it soon recovered and seemed quite normal. Upon its release the intruder again appeared and fighting was resumed. Later the resident bird was again found under some brush and in its former condition, but this time it did not recover and soon died.

An examination of the skinned body disclosed no apparent external injuries. The skull and brain were undamaged and no body bruises were found. The abdominal viscera appeared quite normal and the testes, as was expected, were enlarged. The chest cavity, however, contained a large mass of clotted blood. Careful examination revealed that the ventricular area of the heart was ruptured with a transverse wound about seven millimeters in length. The lips of the wound were projected outward indicating that the force responsible for the injury came from the inside. Walkinshaw (Auk, 62: 141, 1945) mentions the death of a Field Sparrow (*Spizella pusilla*) caused by a ruptured aorta. Presumably the aorta was inherently weak and finally burst due to high blood pressure initiated by severe fright. A similar condition seems to have been responsible for the Cardinal's death.—WILLIAM C. DILGER, Department of Conservation, Cornell University, Ithaca, New York.

**The Generic Name of the Spectacled Eider.**—The Spectacled Eider was first made known to science by Brandt in 1847 (*Fuligulam Fischeri Novam Avium Speciem*, p. 18, pl. 1) under the name *Fuligula* (*Lampronetta*) *Fischeri*. The name *Lampronetta*, although introduced by Brandt in a subgeneric sense, is thus the earliest generic name for this duck.

G. R. Gray (*Proc. Zool. Soc. London*, 23: 212, "1855" = 1856) published the first description of the female Spectacled Eider. At the end of his paper appears the following sentence: "As M. Brandt's subgeneric name of *Lampronetta* is so near *Lampronessa* of Wagler, it may be thought advisable to change it to *Arctonetta*." In this manner was introduced the generic name now universally used for the Spectacled Eider. Wagler's name *Lampronessa*, to which Gray referred, appeared in 1832 (*Isis*, col. 282, 1832) and is a pure synonym of *Aix* Boie, 1828. Although Brandt's name *Lampronetta* may be "near" the earlier *Lampronessa*, the two names must be considered distinct from the viewpoint of zoological nomenclature. According to our modern rules, Gray's action in substituting his *Arctonetta* for *Lampronetta* was unnecessary.

It would thus appear that we are faced with the regrettable fact that an unfamiliar name must be reinstated to take the place of one we have been using, although wrongly so, for nearly a century. There is an alternative, and, I believe, a better solution. The segregation of the Spectacled Eider as a monotypic genus seems to



be based entirely on the feathering of the face and base of the bill. This difference, when contrasted with the overwhelming similarity of *fisheri* to the members of the genus *Somateria*, fades into insignificance. The genus *Somateria*, as presently understood, contains two species, *mollissima* and *spectabilis*, which are spectacularly different from one another in the structure and feathering of the facial region. Males of *mollissima* and *fisheri* are virtually identical in the color pattern of the body, while *spectabilis* has much more black in its plumage. The latter species also shows a greater development of the falcate tertials than does either *mollissima* or *fisheri*. The females and downy young of all three of these eiders are closely similar to one another in all respects except the feathering of the facial region, which reflects to a lesser degree the differences exhibited by the males. Judging from the literature, there seem to be no trenchant differences in reproductive habits or behavior between *fisheri* on the one hand and *mollissima* on the other. If we are to consider as congeneric such superficially diverse ducks as the Mallard, Gadwall, and Green-winged Teal, there is certainly no justification for the continued recognition of a monotypic genus for the Spectacled Eider. I therefore heartily endorse the recommendation of Delacour and Mayr (*Wilson Bull.*, 57: 33, 1945) that the Spectacled Eider be known henceforth as *Somateria fisheri* (Brandt).—KENNETH C. PARKES, Carnegie Museum, Pittsburgh 13, Pennsylvania.

**Some Comments on Vaurie's Revision of the Muscicapini.**—Dr. Charles Vaurie's excellent monograph ("A Generic Revision of Flycatchers of the Tribe Muscicapini," 1953, *Amer. Mus. Nat. Hist., Bull.*, 100: 445-538) has already been reviewed in 'The Auk' (1953, 70: 379-380), and it is not this writer's intention to write an additional review *in extenso*. Rather I would like to point out certain small aspects of the problem of the relationships and resulting classification of the group wherein I differ from Vaurie. These comments are offered partly because I am working on an Indian handlist involving many of the species listed.

One of the main difficulties in a revision of this kind is the end product, after all the pros and cons have been considered, of setting the generic limits within the group. Dr. Vaurie is to be congratulated for his study of the external morphology, his consideration of the value of various characters, whether morphological or behavioral, and his promising attempt to create order and to point to areas of closer relationship in this difficult aggregation of species.

In connection with his useful discussion of comparative habits, I wish that Dr. Vaurie had specified his sources of information. Many of the Muscicapini are rare and have been observed infrequently and by few observers. It is difficult, therefore, to be arbitrary about the habits of some of the species. For example, Dr. Vaurie (without citing his source) states on page 473 and again on page 512 that *Muscicapella hodgei*, which differs from other flycatchers in having a needle-like bill, in addition to being very small, behaves like "a leaf-warbler or *Regulus*" and it "is said to be gregarious and to flutter on bushes and in the lower trees searching for and taking insects from the leaves and twigs more often than it snaps them from the air." Dr. Vaurie goes on to say, "the habits of *Niltava*, discussed under that genus, vary, but its species do not behave like a leaf-warbler or a *Regulus*, as *hodgei* seems to do. As a result of its habits [italics are mine], *hodgei* has become very small and has developed a much longer tarsus and a very narrow and slender bill which, needle-like, is not hooked at the tip."

In spite of this avowed extraordinary difference, Dr. Vaurie has seen fit to throw *hodgei* into the genus *Niltava* although he feels that behavioral differences are important. I seriously question a statement such as the one I have italicized about



this little bird having become small as a result of its habits. I also question its habits as noted. Mr. Salim Ali, Dr. Walter Koelz, and I are, so far as I know, the only three field collectors who have seen this elusive little flycatcher in recent years. Mr. Ali (pers. comm.) tells me that he observed the bird fly to the ground, pick up an insect, flick its tail (like *Siphia parva* or *Muscicapa hyperythra*, both of which are put into the genus *Ficedula* by Vaurie) and fly back to its low branch in a thicket. I have seen the species in Nepal hunched on a low branch in a thicket, looking just like *M. hyperythra*.

As flycatchers will occasionally vary their usual behavior under the stress of circumstances, such as a sudden swarming of insects, and as no other observer has seen this species fluttering through the trees like a warbler, I suggest that this behavioral character is aberrant. I also suggest that the peculiar bill character of *hodgsoni*, its rarity, and the lack of observations in general about its life history or habits, make the conservative course of keeping it in a monotypic genus *Muscicapella* rather than submerging it in one genus or another arbitrarily, the better action. Dr. Vaurie has suggested that it is a subgenus of *Niltava*. According to his own professed criteria, I could arbitrarily suggest that it be a subgenus of *Ficedula*. After all, it does not fit his diagnosis of the genus *Niltava* in the first instance (p. 473) except that it is blue above and buffy below, a character shared with his other genera *Ficedula* and *Muscicapa*.

Following is an analysis of the characters assigned to the three genera by Vaurie:

	<i>Ficedula</i>	<i>Niltava</i>	<i>Muscicapa</i>
Size:	"small"	"medium to large" [but how about <i>hodgsoni</i> ?]	"small"
Tarsus:	"moderately long to long slender"	"relatively short, of medium thickness"	"short to very short, usually weak"
Bill:	"small"	"large" [but how about <i>hodgsoni</i> ?]	"variable"
Pattern and color- ation:	"variable but not streaked . . . with white on head and tail in about 2/3- 1/2 of species." [sic.]	"characteristic, not streaked and with blue and rufous marking, without white on head and, with one exception, without white on tail."	"dull, streaked or with indications of streaks, no white on head or tail, gray brown to blue gray or slate, one species rufous."
Habit:	"not truly arboreal with very few exceptions"	"variable, arboreal or in undergrowth"	"arboreal"
Song:	"usually varied or pleasing"	"all are said to be good singers" [On several species such as <i>hodgsoni</i> there are no observations!]	"poor singers"

On the basis of these variable characters, I feel that these composite genera cannot stand. They become meaningless as they are. The alternative, which seems more legitimate to my mind, would be to merge the majority of the species in *Muscicapa*, the oldest name, leaving a few well-marked or aberrant species in monotypic or small genera. By submerging a "mélange" of species in a few genera, I do not feel that the relationships (which ought to be the measure of the genus) are any better served. As Vaurie says (p. 496), he differs completely from Stresemann's arrangement based on wing formula (1912, Novit. Zool. 19: 323-330) which in Vaurie's opinion is not of equal value in the different groups of species. The characters listed by Vaurie may also be presumed to be of unequal value. Indeed, some aberrant forms such as *Siphia timorensis* are admitted by Vaurie to be not certainly flycatchers at all. The almost total lack of adequate field observations on most of these tropical species makes the use of behavioral characters in a taxonomic revision still seem relatively unimportant, or indeed at times specious.

A somewhat similar nomenclatorial situation is presented by Dr. Vaurie's treatment of some of the African species. *Bradornis* is characterized by the author as consisting of moderately large to large species with thick and relatively short tarsus, rounded wing, attenuated bill, and concealing drab coloration; "drops to the ground to feed"; usually silent. In this genus is included *Empidonis semipartitus* although that species is silvery gray above and bright orange brown below (hardly drab), has a not particularly attenuated bill, is medium to large in size without an impressively thick tarsus, has a tail which is differently shaped from the other species, and has a "pleasing musical song." However, in spite of these differences it is kept in *Bradornis* by Vaurie as a potential subgenus.

One of the few observations of *Empidonis* in the field is that of Lynes (1925, Ibis: 123) who notes that this species is a bird of open glades in woodland, rather than open bush country, that it has a sweet "turdine" song and might better be called a "Robin-flycatcher" (i.e. *Erithacus*) than a flycatcher. He describes the nest and eggs as being very different from those of *Bradornis*. Without further contradictory information, the above seem to me sufficient reasons for recognizing the distinctness of the genus *Empidonis* for this aberrant species.

The species *Bradornis herero* is so little-known that it seems almost useless to comment on it, but I should like to suggest here that whether by convergence or relationship, it shows a distinct resemblance to the chat-like thrushes represented by *Erythropgia* and *Cercomela*.

The foregoing are intended as a series of precautionary comments on an excellent paper. Indeed the last word has by no means been said on the status and rank of members of this difficult group. I would certainly hope that Dr. Vaurie himself would at some time have an opportunity to pursue these studies in the field in Africa and Asia and gain personal observations on the habits and behavior of many of these provocative and little-known species.—S. DILLON RIPLEY, Peabody Museum, Yale University, New Haven, Connecticut.

**Notes on Cowbird Parasitism on Four Species.**—Little information appears to be available on the parasitism by the Cowbird (*Molothrus ater*) of the Yellow-breasted Chat (*Icterus virens*), Brown Thrasher (*Toxostoma rufum*), Redwing (*Agelaius phoeniceus*), and the Cedar Waxwing (*Bombicilla cedrorum*). The following report briefly outlines the published records and my own observations for Cowbird parasitism in these host species.

*The Yellow-breasted Chat.*—Friedmann (The Cowbirds, 1929: 193) wrote: "The Robin, Catbird and Yellow-breasted Chat are examples of absolutely intolerant

species." On pages 194-195 he stated: "Many birds desert their nests if the Cowbird lays first. The Yellow-breasted Chat, however, deserts even if it has eggs of its own." On page 249, he qualified the two previous statements when he wrote: "The eggs of the Chat are very similar to those of the Cowbird, but nevertheless the nest is almost invariably deserted if a parasite egg is laid in it." On page 250, he cited one example of Chats' tolerance of Cowbird eggs, listed two pairs which raised Cowbirds, and concluded by stating that: "Apparently there is considerable variation in the sensitiveness of Chats around their nests, but the bulk of evidence goes to show that normally a Cowbird's egg has little chance of ever being hatched by a Yellow-breasted Chat." A. C. Bent (*Life Histories of North American Wood Warblers*, U. S. Natl. Mus. Bull. 203: 594, 1953) did not add any specific instances to Friedmann's list but expressed the opinion that many cases of this tolerance have occurred.

Although the Chat is listed by Wood (*Birds of Michigan*, 1951: 418-419) as a rare summer resident north to Lansing in Michigan, a number of nests have been recorded in the past. One nest which I reported in that publication (p. 419) was abandoned with two eggs and one of the Cowbird. Since my discovery of that nest on Grosse Isle, Wayne County, Michigan, May 23, 1937, I have found nine active nests of the Chat, all within 10 miles of Cranbrook, Bloomfield Hills, Oakland County, Michigan. Douglas S. Middleton (*Bird Survey of the Detroit Region*, Detroit Audubon Society, 1950: 64) found one nest of the Chat in Warren Township, Macomb County, June 26, 1950. This nest contained three eggs of the Chat and four of the Cowbird. Ten, or 90.9 per cent of these eleven nests were parasitized by Cowbirds. The number of Cowbird eggs per nest was as follows: five nests, one each; two nests, two each; and remaining three nests held three, four, and five eggs of the parasite. In five of these nests, Cowbirds hatched as follows: July 3, 1947, one; June 15, 1952, two; June 29, 1952, one; June 17, 1953, one; and June 14, 1953, one. Four of five nests, raised young in the following order: one nest, June 25, 1952, two Cowbirds and no Chats; one nest, July 3, 1952, one Cowbird and two Chats; one nest, June 21, 1953, one Cowbird and four Chats; one nest, June 22, 1953, one Cowbird and three Chats. The fifth nest in which Cowbirds were hatched was destroyed by falling from its insecure anchorage when its lone Cowbird occupant was five days old. Three other nests were not abandoned when first parasitized. One of these nests found on June 4, 1944, contained three Chat eggs and three of the Cowbird. On June 6 and June 8, I found the female still incubating. The nest had been abandoned by June 11. Observations on two other nests cast some light on the duration and degree of tolerance in this pair of Chats. A nest, apparently completed, was discovered about 7:00 P.M. on June 15, 1947. In the late afternoon of June 16, I found one egg of the Chat and two of the Cowbird. Two days later, June 18, at 8:30 P.M., the nest contained five eggs of the Cowbird and two of the Chat. The female Chat was on the nest and the eggs were warm. On June 19, at 8:30 P.M. the nest was empty and hanging sidewise from the fork of the shrub in which it was built; one Chat egg was on the ground underneath. Several fresh cattle tracks were found underneath the nest, indicating that the nest had been upset by the herd brushing against it in passing. The second nest of this pair with three eggs of the host and one of a Cowbird was found nearby on June 29. When next I observed this nest, July 7, at 8:00 P.M., it contained only one 3-day-old Cowbird. The shells of the Chat eggs were on the ground underneath. The Cowbird was still in the nest, July 8, at 8:00 P.M. On July 10, at 8:00 P.M. the nest was empty, and apparently the Chats had left the locality.

Only three nests of ten parasitized, or 30 per cent, were abandoned before incubation started. One nest with three 7-day-old Chats, found July 13, 1947, apparently was not parasitized.

*Brown Thrasher*.—Friedmann (The Cowbirds, 1929: 253) stated that, "J. Allen saw a female Brown Thrasher feeding a nearly full grown Cowbird in Western Iowa in 1868." He stated further that, "as far as I know the late Dr. Allen's observation has remained unique to this day." However, A. C. Bent (U. S. Natl. Mus. Bull. 195: 371, 1948), wrote that, "Tilford Moore (MS) saw a Brown Thrasher feeding three young Cowbirds." No date, place, or other details were given.

On the Cranbrook Estate in Bloomfield Hills, I have found three pairs of Brown Thrashers which had Cowbird young in their nests. The dates were May 10, 1941, June 23, 1950, and June 3, 1952. I found the 1941 nest on April 26, when it contained three eggs of the Thrasher. I made observations on the two succeeding days (April 27 and 28). The Cowbird egg was laid April 28. On May 3, the nest held three Thrasher eggs and the Cowbird egg. When I next was able to visit the nest on May 10, I found two 3-day-old Thrashers and one 2-day-old Cowbird. One Thrasher egg or young had disappeared. At noon on May 12, I found that the Cowbird nestling had disappeared. At this time I placed a 3-day-old Cowbird nestling from the nest of a Song Sparrow (*Melospiza melodia*) in the Thrasher's nest. On May 15 at 8:00 P.M., I found the Cowbird and the two nestling Thrashers, all apparently of normal growth. All young were still in the nest the next day (May 16) at 3:00 P.M., when they were photographed. On May 19 at 2:00 P.M., I found the nest empty. The Thrasher young were nine days old and the Cowbird six days old when they were last seen in the nest.

The 1950 Brown Thrasher nest contained two eggs of the hosts and two of the Cowbird when I discovered it on June 14 at 8:00 P.M. On June 17 and June 19 at 7:00 P.M. I observed two eggs of each species, as before; an adult was incubating both times. When I observed the nest at 8:30 A.M. June 23, one Cowbird had just hatched, one Cowbird egg and two Thrasher eggs remained. At 8:00 A.M. June 25, the nest held one Thrasher still wet, one almost dry, and one Cowbird. The other Cowbird or egg had disappeared. I made observations on June 27 and 29 and on July 2 and 4. The three were photographed on July 4, at which time they appeared ready to leave the nest. On July 5 at 7:00 P.M., I found the nest empty. I believe they left the nest successfully.

I found the 1952 nest on June 3 at 7:00 P.M. when it contained four 4-day-old young of the Brown Thrasher and one 5-day-old Cowbird. All young were banded. I was not able to visit the nest again until 9:00 A.M. June 9 when I found the nest empty.

Cowbirds' eggs in the nests of Brown Thrashers have been reported more frequently than have Cowbird young. Friedmann (The Cowbirds, 1929: 253 and Wilson Bull., 46: 32, 1934) reported ten definite records of Cowbirds' eggs in Brown Thrashers' nests from the following states: Connecticut, Pennsylvania, Iowa, Nebraska, North Dakota, and Oklahoma. A. C. Bent (U. S. Natl. Mus. Bull. 195: 370) stated that he had several records of Cowbirds' eggs in Thrasher nests but did not give any further data. I have two records of Cowbirds' eggs in nests of Brown Thrashers found on the Cranbrook Estate on the following dates: May 5, 1942, and May 13, 1952. The Cowbird egg in the 1942 nest was laid on the day the second Thrasher egg was laid and remained nine days after the Thrashers began incubating four of their own eggs on May 7, or 11 days from the time it was laid. All eggs were in the nest at 11:00 A.M. May 16, but had disappeared before the last observation at

12 noon, May 18. The Cowbird egg in the 1952 nest was laid two days after the Thrashers' nest with five eggs was found. One Thrasher egg disappeared the previous day. The Cowbird egg and two more of the hosts' eggs disappeared the next day, but the Thrasher was still on the nest. On May 16, at 12 noon, I found the nest deserted and all eggs gone.

*Eastern Redwing.*—Friedmann (The Cowbirds, 1929: 212) stated that over 50 records of Cowbird eggs in Redwing nests had come to his attention, "ranging from Connecticut, Ohio, and Indiana west to Michigan and Illinois, and south to Oklahoma." He also mentions (p. 212) Cowbird eggs in Redwing nests as of reported common occurrence in Nebraska and reports several nests of the Redwing containing two or three Cowbirds' eggs in North Dakota.

I have found two nests of the Redwing in which Cowbird young have been hatched. The first nest, which contained four eggs of the host and one of the Cowbird, was discovered May 29, 1952. When next I visited the nest on June 11, it contained four 7-day-old Redwings. In the water beneath the nest I found a dead 5-day-old Cowbird which may have been crowded out by the larger Redwing young. The other nest was found on June 19, 1952. It contained three 5-day-old young of the Redwing and one 4-day-old Cowbird, which were banded. Unfortunately, I was not able to visit the nest afterward, hence do not know whether the young survived to leave the nest.

The frequency of known parasitism in 1,300 active nests of the Redwing, which I have recorded during the last 15 years, has been about one in every 185 nests. Nests of the Redwing in which I have found Cowbird eggs were as follows: 1950, July 2, one nest; 1952, May 29, one nest; June 10, one nest; June 19, one nest; 1953, May 17, three nests with one Cowbird egg each. Of seven Cowbird eggs found in seven nests, two are known to have hatched, one was infertile, and the others were destroyed when the nests were disrupted. No Cowbird young were known to have been reared. All parasitized nests of the Redwing I have found were either at the perimeters of colonies 100 feet or more from their nearest Redwing neighbors or were solitary and not a part of any colony. I believe that comparatively few Cowbird eggs are laid in Redwing nests which are in definite colonies because of the combined vigilance and pugnacity of the Redwing adults. I believe, moreover, that any Cowbird hatched with two or more Redwings has little chance of survival because of the size and aggressiveness of the hosts' young.

*Cedar Waxwing.*—Friedmann (The Cowbirds, 1929: 234) called the Cedar Waxwing, "an uncommon victim." He states further (p. 234), that, "there are cases on record from various places,—New York, Connecticut and Montana. Aside from these few records there are no data available." A. C. Bent (U. S. Natl. Mus. Bull. 197: 95, 1950) merely cites the above reference from Friedmann.

On June 5, 1953, I found a pair of Cedar Waxwings in the final stages of building a nest on the Cranbrook Estate. The nest was in a tuft of twigs on a horizontal branch of a Tamarack (*Larix laricina*) 15 feet above the ground. On June 23, I saw a young Cowbird about six days old sitting on the side of the nest between two adult Waxwings. I did not climb up to examine the contents of the nest. On June 28, I found two 4- and 5-day-old Waxwings and a 3-day-old Cowbird in the nest with an unhatched Waxwing egg slightly more than half encased in the shell from which the Cowbird had hatched. I banded the Waxwings and collected the egg in which the young, apparently ready to hatch, had died. The first Cowbird was gone. Apparently, two Cowbird eggs were laid in this nest, the first about June 6 or 7 and the other about June 13 or 14, or about two or three days after the

last of the Waxwing eggs was laid. The early hatching of the first Cowbird may have resulted from the Waxwing's having started incubation with the first egg, as has been reported by Crouch who stated (Auk, 53: 4, 1936) that, "one egg is laid each day until the complement is completed, and incubation starts at the laying of the first egg. Regardless of this fact they all hatch at the same time." My observations of the Cedar Waxwing agree that it often sits on the nest, at least for long periods each day after the first egg is laid and sometimes does, apparently, actually incubate at this time. However, when this happens, the young are of two or three distinct sizes indicating different hatching times.—WALTER P. NICKELL, Cranbrook Institute of Science, Bloomfield Hills, Michigan, February 22, 1954.

**A New Name for *Garrulax moniliger bakeri*.**—Mr. Herbert G. Deignan of the United States National Museum has called my attention to the fact that since the genus *Trochalopteron* is now usually lumped with *Garrulax*, *Garrulax moniliger bakeri* de Schauensee (Proc. Acad. Nat. Sci. Phila., 87: 409, 1935) is preoccupied by *Trochalopteron phoeniceum bakeri* Hartert (Bull. Brit. Ornith. Club, 33: 10, 1909).

In view of this, I propose to rename *G. m. bakeri* de Schauensee and suggest that it be known in the future as *Garrulax moniliger stuarti*, this new name, like the old one, referring to E. C. Stuart Baker.—R. M. DE SCHAUENSEE, *The Academy of Natural Sciences of Philadelphia, Philadelphia, Pennsylvania*.

**Colima Warbler (*Vermivora crissalis*) in Colima.**—When Outram Bangs summarized the available information on *Vermivora crissalis* in 1925 (Auk, 42: 251–253) he knew of but one specimen from Colima, the type, though he had corresponded with Percy Lowe of the British Museum during the preparation of the paper. While I was writing my account (Univ. Mich. Mus. Zool. Misc. Publ. No. 33, 1936) of the discovery of the first nest of the species I learned from N. B. Kinnear that the British Museum had two of these warblers from the Sierra Nevada de Colima, and when I worked in the British Museum in May, 1954, Mr. J. D. Macdonald kindly showed me the specimens.

The first known specimen of *Vermivora crissalis* was a female collected by William Lloyd on April 6, 1889, at an altitude of about 8,000 feet on the Sierra Nevada de Colima, and Salvin and Godman published their description of the new species in the July, 1889, issue of the Ibis. The second specimen, a male, was taken by Lloyd's associate, W. B. Richardson, at 12,000 feet on the same mountain, December 6, 1889. Salvin and Godman had already published (in 1880) the warbler section of the "Biologia Centrali-Americana," and they apparently did not publish this second record of the Colima Warbler at all. In 1892 they gave both specimens to the British Museum.

The altitude recorded on the December specimen is greater than any hitherto reported for *Vermivora crissalis*; the December date agrees with our supposition that Colima is only wintering range for this species.—J. VAN TYNE, *University of Michigan Museum of Zoology, Ann Arbor*.



## RECENT LITERATURE

**Birds of Washington State.**—Stanley G. Jewett, Walter P. Taylor, William T. Shaw, and John W. Aldrich. (Univ. Washington Press, Seattle). xxxii + 768 pp., 12 color pls., 99 halftone illus., 51 distr. maps, 1 life-zone map. 1953. Price, \$8.00.—In fairness to its distinguished panel of authors (one of whom, William T. Shaw, died five years before it was published), something should be said about the strange odyssey of this volume, which has survived at least as many buffetings of time and fate as the legendary Ulysses. The original draft was written by Taylor, with the collaboration of Shaw, about thirty years ago. Before it was published the authors went to other assignments, and the manuscript reposed in the files of the U. S. Fish and Wildlife Service for more than two decades. Then Jewett and Aldrich were given the task of reworking the manuscript and bringing it down to date. As anyone who has tried it knows, this is harder than writing one's own book in the first place. But Jewett and Aldrich did a conscientious, creditable job, completing their work in 1950 or earlier, as indicated by the bibliography, which contains only three or four entries later than 1948.

The publisher held the finished manuscript while months lengthened into years and then, as if in sudden remorse, hurried it through press with insufficient time for proofreading. This resulted in a number of unfortunate and wholly unnecessary errors, beginning on the title page with a typographical error in Jewett's name and ending with the life-zone map in a pocket on the inside rear cover, on which the legends for "Arid Transition (timbered)" and "Arid Transition (timberless)" are reversed. Actually the book contains no more than the normal and apparently inevitable number of errors that, embalmed on the printed page, rise up to haunt author, publisher and proofreader; in this case they have the misfortune to be conspicuous.

One other and rather minor flaw in the book can be attributed to the publisher. In the interest of economy, the colored plates (by Roger Tory Peterson, reproduced by permission of the National Audubon Society, frontispiece by E. R. Kalmbach) were made up in pairs and wrapped around signatures instead of being individually tipped in. Thus they are separated by either 32 pages or a multiple of 32, a distribution which, to persons unfamiliar with the art of bookmaking, must seem rather bewildering, e.g., a plate of the Brewer Blackbird turning up between the woodpeckers and the flycatchers, and a plate of the Black-headed Grosbeak opposite a description of the California Loggerhead Shrike.

This reviewer doubts the value of including Piper's 1906 life-zone map (from Contr. U. S. Natl. Herb. 11, *not* 2 as cited in the bibliography) without considerable revision. Piper's map takes no account of the rain shadow of the Olympic Mountains, nor of the fact that the climate of eastern Washington graduates toward that of the Rocky Mountains. Thus we find the anomaly that a sizeable area in western Washington which has a rainfall of less than 20 inches a year and practically no rain in summer (the area includes Sequim, Dungeness, Port Townsend, much of Whidby Island and probably parts of the San Juan Islands) is included in the "Humid Transition," while a larger area in eastern Washington that has an average rainfall of more than 20 inches, with more than half of it in the period April to September (the foothills of the Blue Mountains and much of the Okanogan Highlands), is mapped as "Arid Transition." I do not mean that the authors subscribe to Piper's map—indeed, on page 20, they introduce the term "Semiarid Transition Zone" for much of eastern Washington; I do question the use of an archaic life-zone map without revision.



The authors state in their introduction: "Records in all cases of doubt have been based on properly authenticated specimens; but sight records by observers deemed reliable have been accepted in many cases where the species concerned are widespread in the state or are easily or certainly identifiable." This is a defensible procedure, but it has not been carried out in practice. The Northern Red-billed Tropic Bird, the Northern Blue-footed Booby, and the Bronzed Purple Grackle, supported by one specimen each, are included in the state list, although they no more belong there than a canary or a parakeet. The Caracara, on the other hand, also supported by a specimen, is included only in the hypothetical list. (It is presumed to be an escaped captive bird.)

The Coast Bush-tit, supported only by sight records (and by specimens from the Oregon side of the Columbia River), is included in both the state and hypothetical lists. On p. 483 we read: "John B. Hurley found a nest of this species (sic) . . . on the Yakima Indian Reservation on April 13, 1947," etc. On p. 676 it is stated: "There is some question as to whether this race actually gets into Washington at all." The reader may accordingly feel certain misgivings about the map on p. 482 which shows the "breeding distribution" in Washington of this and the Puget Sound Bush-tit.

In their use of vernacular names, the authors have in general followed the recommendations of the A.O.U. Committee on Nomenclature. They are certainly not to be censured for this; but the A.O.U. Committee might itself well reconsider such infelicitous combinations as Harris Hairy Woodpecker and Mealy Common Redpoll. Consistency is not always a jewel. It is unlikely moreover that northwesterners will ever learn to call *Sialia mexicana occidentalis* the Western Mexican Bluebird. Even the authors occasionally forgot and called it the Western Bluebird, on p. 27 and under the colored plate. The most unfortunate vernacular names, such as Mountain Traill Flycatcher and Interior Slate-colored Junco, will probably fail to gain general usage through lack of acceptance of the underlying taxonomic concepts.

In the treatment of subspecies, and occasionally at the species level (e.g., the synonymizing of *Junco oreganus* with *J. hyemalis*), John W. Aldrich, who is principally responsible for this facet of the book, has paid little heed to the A.O.U. Committee or anybody else. It must be admitted that a taxonomist working on this kind of a book is in a difficult predicament. If he recognizes species or subspecies he considers valid that have not been baptized by the A.O.U., he is clearly open to criticism; if he does not recognize them, he is in the position of repudiating his own views. But persons using this volume should be aware that Aldrich has in effect functioned as a one-man committee on nomenclature.

The shortcomings of this book are largely attributable to multiple authorship, with the authors separated in both time and space, and to lack of liaison between the authors and the publisher. Its merits are genuine and substantial. It is the first comprehensive treatment of the birds of Washington since that of Dawson and Bowles in 1909. The descriptions and nesting data are carefully compiled from reliable sources, with due acknowledgment and occasional comment by the authors. The distributional data are valuable, though not as completely documented as could be wished. (The authors state in their Introduction: "References to the literature have sometimes been amplified or definitized in the text on the basis of correspondence or additional information on the record. It has not been deemed necessary to explain this in each instance.")

The Introduction, 47 pages in length, is itself a very useful document, covering topography, climate, life zones, history of ornithological work in the state, locations of the principal collections, introduction of foreign species of birds, and other topics.

The list of geographical localities referred to in the text, given near the end of the volume, is also a useful feature. The 51 "Breeding Distribution Maps" are helpful; they are not accurate in detail, but such maps are seldom more than approximations. The 99 halftone illustrations are well selected from the work of more than a score of good photographers. Why they are called "plates" is not clear—they are figures in the text; but they are a strong feature of the book.

The greatest importance of this work lies in the authors' comments on each species or subspecies, which make up the bulk of the text. Here we find a wealth of information on habits, behavior, food, distribution, nesting, migration, etc., from the observations of the authors themselves, supplemented by careful selections from the literature. This is the real meat of the volume, and this reviewer has found fascinating reading on every page.

Supplementing its value as a record of field observations, this volume brings into focus the present status of our knowledge of the birds of Washington, making clear the numerous areas in which further research is needed. The authors state with disarming modesty (p. 2): "It is hoped and anticipated that one of the chief values of the report will be in influencing resident ornithologists and others to publish supplementary information, and to make additional observations covering the many gaps apparent."—ROBERT C. MILLER.

**Natural Communities.**—Lee R. Dice. Ann Arbor, Michigan: Univ. of Michigan Press. xii + 547 pp., 17 tables, 52 figs, 1952. \$5.50.—This extensive treatment of terrestrial community ecology is worthwhile and useful, and it will continue to be so for some time to come. It behooves us, then, to examine the book, even a few years after its publication and notwithstanding the appearance of more recent books in the field. While this review should have been in the hands of the editor of 'The Auk' long before this, the delay has had its compensations since the passing time has enabled me to examine Dice's book more extensively and to subject it to various uses in courses and seminars in ecology.

"Natural Communities" deals with the facts and principles of community ecology in a general way and from the standpoint of terrestrial biota. There is very little on fresh-water communities and virtually nothing on marine communities. The chief topics of the 23 chapters are recognition of communities, methods of describing communities and populations, physical factors, food relations, fluctuations, relations of organisms to their ecosystems, spacing, social behavior, interspecies relations, community equilibrium, succession, and, finally, the classification, variation, geography, and history of communities. That is to say, the book gives us a panorama of community ecology as of 1950, stressing field work in terrestrial habitats and, among their animals, the vertebrates. In this latter respect, the book complements Orlando Park's extensive treatment of communities in Allee *et al.*

A chapter on methods of describing and measuring communities, while of necessity brief and bound to appear inadequate sooner than other parts of the book, is a welcome feature and one new to general works on terrestrial ecology. Because the problems posed by sampling in natural communities and populations are numerous, complex, and unavoidable, a student in an introductory ecology course should have access to such a discussion as Dice has now provided. Here various procedures and basic concepts having application to both plant and animal populations are summarized, and this will be useful however rapid the development of sampling and statistical methods in ecology may now be.

As a text, this book may be satisfactory in an advanced course stressing the community basis of field research in ecology and favoring the terrestrial. In a

course at Berkeley taken by seniors and graduates, I tried it as a text one year and found the students tended to get lost in details. While the author has selected these carefully and with relevance, the treatment of community ecology which results seems, in its concern with the scope of the field, to stress broad compartments of thought and all their corners. The result is that the marshalling of facts tends more to support the interplay of principles than to stay rigorously with one basic principle, then another, and so on. The result, however, is that "Natural Communities" is particularly useful for collateral reading.

From the description of the book now given, it is clear that it could have been given a more accurate title. The present title seems to promise a descriptive, comparative treatment of important community-types, their composition and distribution, in all environmental realms. I gain the impression, from discussions and other reviews of this book, that because the contents do not live up to this promise, the real values of the text, in summarizing and systematizing community concepts, have perhaps been put to a scrutiny more severe than might have been called for otherwise.

For the size of the book, the price is surprisingly low, and if there is an angel lurking in the background, we give our deepfelt thanks! The format, type, and binding are fine, and the illustrations (almost all line drawings) are clear. More illustrative material would surely have increased the usefulness of the text. There are several carefully prepared pencil sketches based on large photographs of landscape-types, but they were not all rendered with the same success. Also, reduction in size for publication weakened them. I am sure the original photographs, reproduced as half-tones, would have been more instructive.

In this book, Dice describes and explains more fully than in his earlier publications his system of biogeographic classification, that is, biotic provinces and their subdivisions. I must say that in the context of the modern concept of the ecosystem, biotic provinces make more sense now than they did earlier. I believe that students of biogeography will find the several chapters of this book devoted to this topic stimulating. The arbitrariness, vagueness, and argument usual to discussions in this field are evident here and, I think, not to be held particularly against this book because these faults merely characterize the present-day state of the field as a whole. Perhaps some readers will think this last statement implies an unwarranted optimism! The one complaint I have to make is that Clementsian views regarding community units and their classification are not presented clearly. The attempted comparison of his system with others is therefore misleading. The evidence for this complaint is scattered through chapters 16, 19, and 20. Anyone studying these chapters closely should be acquainted at least with relevant chapters in Weaver and Clements's text, with Cain's 1939 paper in the *American Midland Naturalist*, and with Tansley's chapters on vegetational classification in "The British Isles and Their Vegetation."

I should add, finally that there is a 49-page bibliography, which, for the reason given above, also complements the valuable bibliography in "Principles of Animal Ecology" by Allee *et al.* In addition, at the end of each chapter there is a list of selected references, which are fully cited in the terminal bibliography. This feature adds to the value of the book for collateral reading in ecology courses.

Dr. Dice's course entitled "Natural Communities," taught at the University of Michigan for many years, is the basis of this book. It therefore represents a distillation of materials accumulated over several decades and serves not only as a useful reference book but as a document helping to summarize the history of ecology over the first five decades of this century. A major period in that history seems to have

closed with the appearance of several important books around 1950, which now clear the way for future work. "Natural Communities" is one of them.—FRANK A. PITELEKA.

**The Birds of Arabia.** Colonel R. Meinertzhagen (Oliver and Boyd, Edinburgh) xiii + 624 pp., 1 folding map, 19 col. pls., 9 black and white pls., 53 text figs., 35 distribution maps, August 11, 1954. Four guineas.—As the first book to be written on the birds of Arabia this work fills a distinct place in the faunal literature of ornithology. That it will continue to do so is apparent from the obviously intimate knowledge of the country and its bird life that the author has brought to bear in his presentation. Where the data are meagre or unreliable, the author points out the need for improvement, and it is to be hoped that there may be found other naturalists to pick up where this account leaves off and eventually complete the picture.

Arabia is strategically located at the meeting place of three great faunal regions, the Palaearctic, the Oriental, and the Ethiopian, and its bird life contains species of fairly obvious affinities with each of these sources, as well as others that span them. To most of us, Arabia, if it conjures up any mental picture, means desert. While the greatest part of the land is arid or pure desert, Meinertzhagen points out that there are large areas in the southwestern and the southeastern parts of the country that rise to about 11,000 feet to what is almost an alpine zone. Being a great peninsula surrounded by water on three sides, the country has an unusually long coastal belt for its size—nearly 4,000 miles of seashore, and thus has come to include in its avifauna a large number of shore and water birds. According to a rapid tabulation of the birds recorded in this book, Arabia may claim an avifauna of 381 species, or, including races, 502 species and subspecies of birds. However, considerably less than 100 of these breed in the great peninsula, the rest being wintering birds, migrants, or stragglers.

In his account of each species and subspecies, the author gives what details he can of its local distribution and habits, as well as diagnostic descriptions of its plumages. This naturally comprises the largest part of the book and is the part that will be of continuing usefulness to ornithologists. Occasionally interspersed with these accounts are some statements that show the author's long preoccupation with certain species, and these form welcome summaries. Thus, of the yellow wagtail, of which species no fewer than 14 races have been found to occur in Arabia, Meinertzhagen writes that the species has "an almost entirely continental distribution, and yet we find the reverse of normal variation in that it is not clinal. This is due to the fact that every population is isolated by virtue of its eco-tolerance, which confines them to valleys, swamps and lake shores; their distribution can be likened to that of a species which is distributed over a huge archipelago composed of many hundreds of islands, each isolated from the other and each having its distinctive race; and yet they all, or almost all, meet and mix in their winter quarters . . . ."

Aside from the systematic portion of the book, there are chapters on the geology, geography, and climate of the country, on desert coloration, on distribution and migration of birds, and one on the history of Arabian ornithology. The author has his own ideas on such topics as desert coloration and presents them in an unnecessarily one-sided fashion. In so far as his statements may be taken as his reactions to his observations, no one need quarrel with him, but they are not as final as their presentation seems to infer. Here and there, throughout the book, Meinertzhagen has written with some impatience and irascibility; trends and workers with whom he disagrees are dismissed in rather highhanded manner, and potential critics or dissenters are written down in advance.

Occasionally the author lets himself go in ill advised anthropomorphic expressions, as when he defends his arrangement from crows to ostriches instead of the other way about. "I have resisted the more modern system of placing the most archaic, the stupidest and least educated birds first, as it seems to follow the modern trend to democratise systematics; I prefer placing the best educated, most intelligent and socially superior birds first. Birds are by no means a classless society and cannot be made so, any more than can the human race . . ." Some of his comments on bird behavior are similarly anthropomorphic.

The volume is a handsome example of fine book making; it is well printed on heavy, coated paper, and is embellished by a profusion of illustrations. Of the 19 colored plates, D. M. Henry is responsible for 13, G. E. Lodge for 5, and A. Thorburn for 1. Most of the subjects are well chosen, but it seems a pity to have left some of the little known, desert birds unfigured and to have given colored plates of such familiar creatures as the ringed plover or the hepatic form of the European cuckoo.—HERBERT FRIEDMANN.

**Shearwaters.**—R. M. Lockley. xi + 238 pp., 31 photos. \$4.00. New York: Devin-Adair.—Primarily this book is concerned with the Manx Shearwater (*Puffinus puffinus puffinus*) which nests in thousands upon the author's island home of Skokholm off the coast of Wales, but we are also given a vivid picture of the passage of the seasons in the blooming of the flowers and the migrations and nesting of the other birds of the island. Mr. Lockley made an intensive study for twelve years of the group of shearwaters nesting near his home, banding each one and following their marital relationships and nesting success. He discovered that most birds remated year after year, although a few divorces did occur. One individual nested for ten years, another for eleven.

Because of their enemies, the Great Black-backed Gulls, the shearwaters come to their burrows only during the hours of darkness. Apparently mates never see each other but must recognize each other by voice, there being much variety in the screams and howls of different individuals. Parents never normally see their chick, nor the chick them. Incubation and fledging are prolonged processes, lasting some 51 and 72 days respectively. Each parent incubates for three to five days at a stretch while its partner is fishing far away. When the chick is about 60 days old the parents cease their visits. The young bird stays in the burrow for about six days, then comes out each night for a little exercise of its wings for about a week, then makes its way to the sea during darkness. This is sometimes a long and difficult journey and some young do not reach their goal by morning. The Lockleys gathered up some of these unfortunates before they were found by predatory birds and released them in the sea. Almost at once they swam, drank, bathed, dove, and swam under water with half-opened wings like adults.

Three chapters are devoted to remarkable homing experiments in which nesting birds returned from the Faeroe Islands, from Switzerland, and from Venice. The final chapters tell of the Lockleys' visits to Portuguese islands in search of shearwaters and petrels, adventures in which they showed courage, hardihood, and great determination. On the islands off the coast of Portugal they found: "Every thing was eaten, shot, robbed, or killed down. There were collectors, too, supplying museums and zoos," p. 198. On the Desertas east of Madeira, the Lockleys banded many nesting Bulwer's Petrels, and on the Salvages north of the Canary Islands, many Cory's Shearwaters; these are 'managed' here, the adults unmolested, and each September from ten to twenty thousand fledglings taken for the market.

The many photographs and good index add to the value of this volume. All in all, it is a thoroughly delightful book and an important contribution to ornithology.—  
MARGARET M. NICE.

[This important book, originally published by J. M. Dent and Sons, Ltd., London, in 1942, has not hitherto been reviewed in 'The Auk.' Ed.]

**The Literature of Australian Birds: a History and a Bibliography of Australian Ornithology.**—H. M. Whittell. Paterson Brokensha Pty. Ltd. Perth, Western Australia. Part I (history) 116 pp., Part II (bibliography) 786 pp., 32 plates. Paper bound, 70 Austr. shillings; \$8.00.—The Australian bird students are to be envied. They now possess a superb, critical bibliography of Australian ornithology, written by an author who was not only an ornithologist, but a scholar and bibliophile. In Major Whittell, who unfortunately passed away while the volume was in the press, Australia has lost one of its outstanding ornithologists and bio-historians. Whittell has previously made a name for himself through a series of papers on John Gilbert and other early explorers of Western Australia as well as through his excellent Handbook of Birds of Western Australia (with D. L. Serventy).

Part I is a History of Australian Ornithology from 1618 to 1850 (116 closely printed pages). It is a pleasure to study this history written by one who had the literature at his fingertips and knew both birds and country so intimately. Extensive passages from the books and papers of early explorers are quoted in the original. The 32 plates either portray birds or ornithologists, or facsimiles of manuscripts or title pages. The bibliography, which is part II of the volume, contains the titles of more than 10,000 publications. The majority of the citations are annotated with short abstracts of the contents. With the list of the publications is given a short biography of each author, full of invaluable information which would be difficult to obtain elsewhere. This includes the routes of collectors and expeditions, and references to published biographies and to non-ornithological papers. If anything about this volume is to be criticized it is the fact that much of the paper of the text pages is unfortunately of inferior quality. Nevertheless, we must be grateful to the publisher for his courage in undertaking the publication of this enormous volume. Everyone who has an interest in the Australian region or in the history of ornithology must have this work in his library. Considering its size it is certainly a remarkable buy.—E. MAYR.

**Principles of General Ecology.**—Angus M. Woodbury. (New York: Blakiston Co.) 503 pp., 167 figs. 1954. Price \$6.00.—In 1949 the authors of *Principles of Animal Ecology* (New York: Saunders) stated in the preface that there was a current demand for several types of ecology texts, one of which was "a brief statement of the underlying principles" of ecology (p. vii). Since that time, several such texts have appeared, the most recent of which is Dr. Woodbury's. To ecologists especially, this is an encouraging sign since it further indicates not only the great progress made in the accumulation and synthesis of ecological data in recent years, but also the increasing interest in and demands for this science.

The present work is organized much as some other beginning texts in ecology are—sections on general orientation (history, definitions, organismal and environmental relationships, and limitations of the text), an analysis of physical environmental factors, and finally the many facets of "biotic interrelationships." In speaking of historical perspectives (p. 29) one cannot help but wonder why the author has not brought the reader up to date by indicating more contemporary ecologists and



their important contributions. Even beginning students of ecology should be familiar with the important books by Allee *et al.*, Dice, and others that could be mentioned. The third section of the book entitled "biotic interrelationships" embraces sixteen chapters, dealing with such subjects as populations, communities, adaptations, and social relations. There is, finally, a selected bibliography of about 450 titles. This organization purports to follow the ecosystem approach, but in reality it becomes, in many instances, an analysis of adaptational characters of organisms.

It seems to me that Dr. Woodbury's book will perhaps be of limited use for instructional purposes outside of Utah and the western part of the country for two reasons. In the first place, I believe the author has been entirely too limited in his choice of examples and illustrations for the various ecological principles, because the vast majority of these is taken from the western United States. Although this might not be a serious objection, beginning students in other geographic regions might have some difficulty in grasping principles, the examples of which are continually taken from a flora and fauna largely unfamiliar to them. In the second place, the book is very weak on discussions of fresh-water and marine ecology. Only one short chapter of some sixteen pages is devoted to aquatic ecology. Whereas problems of aquatic ecology might be relatively unimportant in some areas of the country, it would seem that any textbook dealing with basic ecological principles should contain more information on this important phase of ecology. Furthermore, it is difficult for me to see why a beginning textbook in ecology should contain such cumbersome physical details as the periodic table of chemical elements or complex charts on electromagnetic radiations. It is axiomatic that the biotic and abiotic environments are inseparably and intricately interrelated and that students should have a working knowledge of such data, but many of these details might well have been left to the elementary chemistry and physics textbooks. In their place, the author could have discussed more pertinent ecological principles, such as life tables, population growth curves, and density factors.

With only a few exceptions, the illustrative charts, graphs and maps, many of which are original, are presented in a legible and unencumbered fashion. To beginning and advanced students alike, I am certain that these illustrations will be welcome for their clarity. Ornithologists will find a liberal sprinkling of avian examples in the text.—DAVID W. JOHNSTON.

**The Birds of French Cameroon.**—Rev. A. I. Good. Part I, 203 pp.; Part II, 269 pp. Mém. de l'Institut Français d'Afrique Noire, Centre du Cameroun, Série: Sci. Natur. No. 2 (1952) and 3 (1953). The author, long a missionary in French Cameroon, spent nearly a score of years in collecting birds in this protectorate. Of the approximately 6,000 specimens taken, about 5,000 are now in the Cleveland Museum of Natural History and 1,000 in the Chicago Museum of Natural History. The territory had been worked so long and thoroughly by Bates and others that no new species or races were discovered. The author personally collected at all the places shown on the map (Part I, op. p. 18) except three where he sent his boy. A total of 748 forms is listed, while an addendum mentions 183 others likely to be found in Cameroon.

The classification and nomenclature follow Sclater, 'Systema Avium Aethiopicarum.' In view of the simultaneous appearance of the work under review and Bannerman's 'The Birds of West and Equatorial Africa,' it is of interest to note that there are many differences in nomenclature. In the few examples given, Bannerman's usages are given in parentheses: *Telacanthura ussheri* (*Chaetura*); *Alterapus*



*sabini* (*Chaetura*); *Ardea goliath* (*Typhon*); *Burhinus senegalensis* (*Oedicnemus*); *Charadrius tricollaris* (*Afrocyechus*); *Eremialector quadricinctus* (*Pterocles*); *Horizocerus hartlaubi* (*Lophoceros*); and *Clamator cafer* (*C. levaillantii*).

The 70 black and white illustrations are taken from publications by Bates, Chapin, and Malbrant. For each form there is given a brief description of the plumage, colors of soft parts, measurements, statements on status and habits, and localities where collected. There are indices of scientific, English, and native names of the birds. Patently the text was prepared with great care. The assemblage of all the known information on the birds of Cameroon under one cover, will make this publication highly useful.—A. W. SCHORGER.

**Composition of Scientific Words, a Manual of Methods and a Lexicon of Materials for the Practice of Logotechnics.**—Roland Wilbur Brown, Published by the author (c/o U. S. National Museum, Washington 25, D. C.), 1954, 882 pages, \$8.00, postpaid.—For fourteen years the author, well-known as a paleobotanist, has devoted his leisure hours to the assembly of materials that constitute the basis of scientific nomenclature, in both the taxonomic and the ordinary sense. His sources have been many, his four page bibliography including treatises on names for the new baby, vulgar latin and unconventional English, both slang and profane, as well as the the more usual sources. The work is cross-referenced, with English key-words often subdivided under several or many parts. While designed for the lexicographer it will be of maximum aid to systematists in any branch, since in this volume there is to be found a most convenient source of names for new forms of any category, as well as definitions for most such terms that a reader may encounter. The introduction in addition discusses basic latin and greek in those areas of grammar useful to the one who manufactures words for any purpose.

Finally, it may be remarked that the author has chosen to underwrite the publication personally in order to hold the cost at as a low a level as possible so as to make the book available to those of his fellow scientists who operate on limited financial budgets.—ALEXANDER WETMORE.

**Bird Songs of Dooryard, Field and Forest.** No. 2. Recorded by Jerry and Norma Stillwell (Jerry E. Stillwell, R.F.D. 2 Fayetteville, Arkansas). This is the second long-playing phonograph disk to be produced by the Stillwells. The first one (Auk 70: 223, 1953) contained the songs of birds of more southern distribution. This one contains songs of the more northern birds. Some of the species of the first disk are here recorded again that there may be comparisons of species whose songs are similar.

The reproduction of the songs of the 59 species is excellent. The selection of material, in species whose songs vary considerably, gives us examples of the songs that are most typical of the majority that we hear. For many of the species, several songs by different individuals are reproduced, so that we may realize that we are listening to a song of an individual and not the song of the species.

Throughout, the arrangement of species is such that we can compare songs that seem confusingly alike and note the differences. Thus the disk begins with the Robin, the Summer and Scarlet tanagers, and the Rose-breasted Grosbeak. These are followed by the Orchard and Baltimore orioles. Soon after, we find the Red-eyed, Yellow-throated and Blue-headed vireos, the last named singing not only its regular song, but also the one in which it runs all of its notes together, without a pause. We hear the snappy song of the White-eyed Vireo and some of its imitations. The curious question and answer song of Bell's Vireo is well reproduced, and the Warbling Vireo is followed, very appropriately, by the Purple Finch.

The little-known song of Lincoln's Sparrow is of interest, for it shows how this bird is much more readily identified and distinguished from the Song Sparrow by its song than by its plumage. There are songs of ten sparrows, fourteen warblers, and the disk ends with songs of all five of the *Hylocichla* thrushes.

In some of the records, the songs are first played as they are sung and then they are slowed down until they are an octave or more lower in pitch. By this means, the song is made richer in quality to our ears, and we get many little short notes that we could not have distinguished at normal speed.

This disk should prove exceedingly helpful to many bird lovers who find difficulty in remembering songs from year to year. The fact that we can hear two somewhat similar songs, one after the other, as we seldom or never could in nature, makes it especially valuable. It is also helpful to those of us who wish to study details and variations of songs. If, in the winter months, we grow hungry for bird songs, we can turn on the phonograph, close our eyes, and imagine that a Robin is carolling in the dooryard, or that we are out in the field and a Vesper Sparrow is singing, or that we are listening to a Hermit Thrush up in the mountain forest.—ARETAS A. SAUNDERS.

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- JOHNSTON, R. F. 1954. Variation in breeding season and clutch size in Song Sparrows of the Pacific Coast. *Condor*, 56: 268-273.—This analysis of breeding season and clutch size for several localities from Baja California to Alaska (36

degrees of latitude) reveals that the breeding season is shorter and begins later in the year at higher latitudes. Clutch size increases with increasing latitude and altitude but with decreasing longitude, and when these data are compared with Hopkins' bioclimatic law, there is a good correlation between retardation of breeding and increasing latitude, altitude and probably longitude.—David W. Johnston.

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- blythii rupchandi*, *Bambusicola fytchii rincheni*, *Arborophila rufogularis tenebrarum*, *Alectoris graeca farsiana*, *Francolinus francolinus festinus*, *F. gularis ridibundus*, *F. pondicerianus prepositus*, *F. p. titar*, *F. p. paganus*, *Rallus aquaticus arjanicus*, *Scolopax rusticola ulimus*, new subspecies.
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- LORD, F. P. 1954. Notes on a Sparrow Hawk. N. H. Bird News 7 (1): 38-39. Activities noted during rearing of a downy young.
- LORD, F. P. 1954. Nesting of a Pine Siskin. N. H. Bird News 7 (3): 32. A second nest (see Auk, 1941). Parents not observed to brood young even during long rainy period; both parents fed young by regurgitation, and male fed female during incubation.
- MANVILLE, R. H. 1954. Vertical migration in certain fringillids. Wilson Bull., 66: 146.—At Shenandoah National Park, Virginia.
- MCATEE, W. L. 1953. Longevity of bird names. Names, 1: 85-102. (Reprints available from the American Name Society, University of California Press, Berkeley 4, Calif.; price, ten cents.).—A well documented article on the history of vernacular names of birds.
- McKINNEY, D. F. 1954. An observation on Redhead parasitism. Wilson Bull., 66: 146-148, 4 photos.—An *Aythya americana* observed laying an egg in a nest occupied by a female Canvasback (*Aythya valisineria*).
- MCLEOD, E. R. 1954. Sandhill Cranes at Meiss Lake, northern California. Condor, 56: 227.
- MEANLEY, B. 1954. Nesting of the Water-turkey in eastern Arkansas. Wilson Bull., 66: 81-88, 2 photos.—Observations on one colony of *Anhinga anhinga*.
- MILLER, A. H., and R. T. MOORE. 1954. A further record of the Slaty Finch in México. Condor, 56: 310-311.
- MILLER, F. W. 1954. Ross Goose in Texas. Condor, 56: 312.
- MILLER, L. 1954. A Sparrow Hawk's roosting schedule. Condor, 56: 230-231.
- MINER, N. R. 1954. Golden Eagles attacking coyote. Condor, 56: 223.
- MITCHELL, M. H. 1954. North American birds on the Brazilian coast. Wilson Bull., 66: 139-140.—8 species, 6 being shorebirds.
- MONSON, G. 1954. Westward extension of the ranges of the Inca Dove and Bronzed Cowbird. Condor, 56: 229-230.
- NAYLOR, A. E., A. W. MILLER, and M. E. FOSTER. 1954. Observations on the Sandhill Crane in northeastern California. Condor, 56: 224-227.
- NICE, M. M. 1954. Problems of incubation periods in North American birds. Condor, 56: 173-197.—In this lengthy discussion, the author defines the incubation period and then points out persistent errors concerning the incubation periods of New World species, these having been copied and quoted as erroneous data for more than 100 years in some cases. Several people have guessed that the length of incubation corresponds to the size of the bird or the egg, but Nice

- points out that "the critical factor determining length of incubation is rate of development of the embryo."—David W. Johnston.
- NICKELL, W. P. 1954. Redwings [*Agelaius phoeniceus*] hatch and raise a Yellow-billed Cuckoo [*Coccyzus americanus*]. Wilson Bull., 66: 137.
- NICKELL, W. P. 1954. Yellow-billed Cuckoo's [*Coccyzus americanus*] egg in Mourning Dove's [*Zenaidura macroura*] nest. Wilson Bull., 66: 137.
- NICKELL, W. P. 1954. Mourning Doves [*Zenaidura macroura*] nest in Black-crowned Night Heron [*Nycticorax nycticorax*] nests. Wilson Bull., 66: 137.
- NORRIS, R. A. 1954. New information on the White-crowned Sparrow in southern Georgia. Oriole, 19: 25-31.
- O'NEILL, E. J. 1954. Ross Goose observations. Condor, 56: 311.
- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds, Mass. Aud. Soc. 9: 1-20. Unusual records of freshwater ducks; over 11,000 Kittiwakes off Cape Ann in one day; and many unusual spp. of passerines, including Arkansas Kingbird, Bullock's Orioles (2), Western Tanagers (8), Black-headed Grosbeak, and Oregon Juncos (3). 162 spp. are listed for January.
- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds. Mass. Aud. Soc. 9: 21-40. Geese started north from Plum Id. by February 19; 23 spp. of ducks included 2 Shovellers; Turkey Vultures in Conn., February 22-27; singing Woodcock, February 22 in Mass.; Northern Phalarope at Eastham, Mass.; many passerines included "over a dozen" Hoary Redpolls and large numbers of White-winged Crossbills. 161 spp. are listed for February.
- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds. Mass. Aud. Soc. 9: 41-60. Turkey Vulture in Vermont; Black Vulture in Mass.; Iceland and Ring-billed gulls in central Mass.; and Green-tailed Towhee at Bradford, Mass. 164 spp. are listed for March.
- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds. Mass. Aud. Soc. 9: 61-88. Glossy Ibis on Martha's Vineyard; Gyrfalcon at Mt Tom (Mass.); a "wave" of passerines on April 26 brought many early records. 219 spp. are listed for April.
- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds. Mass. Aud. Soc. 9: 89-124. Reddish Egret at Monomoy, Mass., on May 31; Glossy Ibis from Maine and Mass.; Black-headed Gull at Pittsfield, Mass., and many rare or uncommon passerines, included Painted Bunting in Brookline, Mass. 261 spp. are listed for May.
- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds. Mass. Aud. Soc. 9: 125-156. Two Black-necked Stilts at Plum Id., June 5 are first record since 1860's in Mass. First breeding record of Least Tern in New Hampshire. Albino Ruby-throated Hummingbird in Maine. 248 spp. are recorded for June-July.
- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds. Mass. Aud. Soc. 9: 185-216. Swainson's Hawk at Nauset, Mass.; Great Gray Owl at Munsungen Lake, Maine; a dozen reports of Arkansas Kingbirds and Lark Sparrows; and two Yellow-headed Blackbirds on Nantucket Id., Mass. 264 spp. are listed for August.
- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds. Mass. Aud. Soc. 9: 217-244. Duck counts were generally low; many other spp. lingered in the mild October weather; a Purple Sandpiper in Pittsfield, Mass.; Red-bellied Woodpecker in Conn.; Summer Tanager, Blue Grosbeaks, and Lark Buntings in Mass. 266 spp. are listed.



- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds. Mass. Aud. Soc. 9: 245-268. A warm, stormy November produced many unusual late records. A Ruff at Nantucket Id., Mass., Nov. 28 and Black-headed Grosbeak at Tiverton, R. I., Nov. 15-21 were outstanding rarities. 223 spp. are listed.
- PARKER, H. M. and R. P. EMERY (eds) 1953. Records of New England Birds. Mass. Aud. Soc. 9: 269-292. Cattle Egret in Me.; Whistling Swans in Vt., and Black Gyrfalcon in Mass. highlighted a mild, open December. 195 spp. are listed.
- PARKES, K. C. 1954. Traill's Flycatcher in New York. Wilson Bull., 66: 89-92—Presenting evidence for the invasion into New York State of a more westerly race of *Empidonax traillii*.
- PARKES, K. C. 1954. The generic name of the Rice Grackle. Condor, 56: 229.
- PARKES, K. C. 1954. Correction of data reported on *Atlapetes brunnei-nucha*. Condor, 56: 231
- PEARSE, T. 1954. Further notes on Red-throated Loons nesting on Vancouver Island, British Columbia. Condor, 56: 308-309.
- PHELPS, W. H. 1953. El posible hundimiento parcial de la Isla de Aves. Bol. Acad. Ciencias Físicas, Matemáticas y Naturales, 50 (Mayo-Agosto): 1-34.—The possible partial sinking of Aves (Bird) Island, lat. 15° 42' N, long. 63° 38' W. In Spanish.
- PHELPS, W. H., and W. H. PHELPS, JR. 1954. Notes on Venezuelan birds and descriptions of six new subspecies. Proc. Biol. Soc. Wash., 67: 103-113.—*Otus aequatorialis venezuelanus*, *Xenops rutilans perijanus*, *Terenura callinota venezuelana*, *Platyrinchus mystaceus perijanus*, *Tyranniscus vilissimus tamae*, and *Coereba flaveola melanornis*, new subspecies. Notes on seven other species include the first record of *Calidris canutus* in Venezuela.
- PINTO, O. 1953. Sobre a Coleção Carlos Estevão de peles, ninhos e ovos das aves de Belém (Pará). Papéis Avulsos do Dept. Zool. Secretaria da Agricultura, S. Paulo, Brasil, 11: 113-224.—On Carlos Estevão's collection of skins, nests, and eggs of the birds of Belém (Pará). In Portuguese. An annotated list, illustrated with 16 plates showing photographs of nests of 17 species.
- PINTO, O. M. DE O., and E. A. DE CAMARGO. 1952. Nova contribuição a ornitologia do Rio das Mortes. Resultados da expedição conjunta do Instituto Butantan e Departamento de Zoologia. Papéis Avulsos do Dept. Zool. Secretaria da Agric., S. Paulo, Brasil, 10: 213-234.—New contribution to the ornithology of the Rio das Mortes. *Nyctiprogne leucopyga majuscula*, *Furnarius leucopus araguaiae*, *Schistochlamys ruficapillus sicki*, new subspecies. In Portuguese.
- PINTO, O. M. DE O., and E. A. DE CAMARGO. 1954. Resultados ornitológicos de uma expedição ao Território do Acre pelo Departamento de Zoologia. Papéis Avulsos do Dept. Zool., Secretaria da Agric., S. Paulo, Brasil, 11: 371-417.—Ornithological results of an expedition to the eastern part of the Territory of Acre. In Portuguese.
- QUIGLEY, R., JR. 1954. Unusual Black Phoebe nest. Condor, 56: 223.
- QUIGLEY, R., JR. 1954. Unusual Barn Owl nest location. Condor, 56: 315.
- RAND, A. L. 1954. On the spurs of birds' wings. Wilson Bull., 66: 127-134, 1 fig.—A survey of the species possessing wing spurs and knobs, their structure and probable function.
- RECHNITZER, A. B. 1954. Status of the Wood Ibis in San Diego County, California. Condor, 56: 309-310.



- RICHARDS, T. 1954. Our changing bird life. N. H. Bird News, 7 (1): 3-16. Population changes of many spp. are discussed in relation to hunting for home use, market hunting, land use, and introduction of foreign spp. during the period 1623-1900.
- RICHARDS, T. 1954. Christmas bird counts. N. H. Bird News, 7 (2): 20-26. New Hampshire counts including a 5-year comparison in the Laconia region.
- RICHARDSON, F. 1954. Report on the two native passerines of Nihoa, Hawaii. Condor, 56: 224.—*Ptiliostroma cantans* and *Acrocephalus familiaris*.
- SCHILLER, E. L. 1954. Studies on the helminth fauna of Alaska. XVIII. Cestode parasites in young Anseriformes on the Yukon delta nesting grounds. Trans. Amer. Micros. Soc., 63 (2): 194-201, 7 figs.
- SINGH, K. S. 1954. Some trematodes collected in India. Trans. Amer. Micros. Soc., 63 (2): 202-210, 1 pl. Includes description and discussion of 3 spp. from ducks.
- SMITH, H. W. 1954. Isolation from the lower respiratory tract of chickens of bacteria administered by mouth. Nature, 174 (4418): 45. *Salmonella gallinarum* was obtained from trachea and lungs when administered in the food, drinking water, or directly into the mouth.
- SOOTER, C. A. 1954. Franklin Gulls riding whirlwind and feeding. Condor, 56: 313.
- SOOTER, C. A., E. E. BENNINGTON, and L. B. DANIELS. 1954. Multiple use of Cliff Swallows' nests by bird species. Condor, 56: 309.
- SPALDING, D. A. 1954. Instinct, with original observations on young animals. Brit. Journ. Anim. Behav., 2 (1): 2-11. (Reprinted from Macmillan's Magazine, Vol. 27, pp. 282-293, 1873.) An account and discussion of original experiments and observations on instinct in young animals, esp., chickens and turkeys. Blindfolds and hoods were placed over newly-hatched chicks. Several days later, the chicks, usually with the blindfold removed, were placed in various stimulus situations, i. e., placed 9 or 10 feet from a box in which a hen and her chicks were concealed. The relationship, mentioned on p. 7, between an 11-day-old turkey and a newly-hatched chick sounds very much like imprinting. This article could be profitably read by all those interested in avian behaviour.—J. Woodford.
- STILLWELL, J., and N. STILLWELL. 1954. Notes on the call of a Ferruginous Pigmy Owl [*Glaucidium brasilianum*]. Wilson Bull., 66: 152.
- STORER, R. W. 1954. A hybrid between the Chipping [*Spizella passerina*] and Clay-colored [*S. pallida*] sparrows. Wilson Bull., 66: 143-144.
- STORER, R. W. 1954. A fossil thrasher from the Pleistocene of Mexico. Wilson Bull., 66: 144-145.
- SUTTON, G. M. 1954. Western Grebe in Oklahoma. Condor, 56: 229.
- SUTTON, G. M., and D. F. PARMELEE. 1954. Nesting of the Greenland Wheatear on Baffin Island. Condor, 56: 295-306.
- TABER W. 1954. Birds of the Waterville Valley Region. N. H. Bird News 7 (2): 3-7. Topography and general appearance followed by annotated list of 86 spp. seen by F. H. Allen (1894 and 1898) and author (1935-1938 and 1953).
- TALMADGE, R. R. 1954. Turkey Vulture wintering in northern California. Condor, 56: 227-228.
- TERRES, J. K. 1954. The care and feeding of wild birds. N. H. Bird News 7 (2): 11-12. Reprinted from Audubon Magazine. A basic food, supplements, and helpful hints.
- THORPE, W. H. 1954. Some concepts of Ethology. Nature, 174: 101-105.

- TWENTE, J. W., JR. 1954. Predation on bats by hawks and owls. *Wilson Bull.*, **66**: 135-136.—At bat caves.
- UDAGAWA, T. 1954. Karyogram studies in birds. III. The chromosomes of five forms of birds. *Annot. Zool. Jap.*, **27**: 91-96.—*Emberiza e. elegans*, *Acrocephalus arundinaceus orientalis*, *Ixobrychus s. sinensis*, *Larus crassirostris*, and *Gallinula chloropus indica*.
- UDAGAWA, T. 1954. The taxonomic position of the Hedge-Sparrow considered from the karyological characteristics. *Jap. Journ. Genetics*, **29**: 87-88.—Chromosomes of *Prunella r. rubida* compared with those of *Luscinia c. calliope*.
- UDVARDY, M. D. F. 1954. Summer movements of Black Swifts in relation to weather conditions. *Condor*, **56**: 261-267.—The summer occurrence of *Nephoceetes niger borealis* at Vancouver, B. C. is shown to be correlated with a low barometric pressure, a SE-E prevailing wind, and rain. The movement of this swift is believed by the author to be governed by the same mechanisms worked out for *Apus apus* in Europe, namely, the presence of insect-laden winds in the warm cyclonic area. The precise origin of the swift "swarms" is unknown, but they are believed to gather over a considerable area.—David W. Johnston.
- VAN DEN AKKER, J. B. 1954. A wintering concentration of eagles [*Haliaeetus leucocephalus* and *Aquila chrysaetos*] in Oklahoma. *Wilson Bull.*, **66**: 136.
- VAUGHAN, T. A. 1954. Diurnal foraging by the Great Horned Owl [*Bubo virginianus*]. *Wilson Bull.*, **66**: 148.
- VON HOLST, E. 1954. Relations between the Central Nervous System and the Peripheral Organs. *Brit. Journ. Anim. Behav.*, **2** (3): 89-94.
- WALLACE, V. 1954. The winter season. *N. H. Bird News*, **7** (2): 13-17. Compilation of winter records for the State.
- WALLACE, V. 1954. Spring migration records. *N. H. Bird News*, **7** (3): 18-31. List of spp. recorded in N. H. Feb.-April.
- WALLACE, V., and T. RICHARDS. 1954. Fall migration records. *N. H. Bird News*, **7** (1): 23-37. A list of fall spp. and summary. Two Cattle Egrets, a European Widgeon, and a Mockingbird as far north as Berlin were outstanding state records.
- WOLFSON, A. 1954. Body weight and fat deposition on captive White-throated Sparrows in relation to the mechanics of migration. *Wilson Bull.*, **66**: 112-118, 1 fig., 4 tables.—Migrating *Zonotrichia albicollis* varied in weight and fat deposition; these differences were correlated with each other and were thought to be correlated with the migratory behavior of the individuals: fat birds prepared for a flight and lean birds having completed a flight.—J. T. Tanner.
- WOOD-GUSH, D. G. M. 1954. The Courtship of the Brown Leghorn Cock. *Brit. Journ. Anim. Behav.*, **2** (3): 95-102. The mating behavior of five Brown Leghorn cocks was analyzed. The number of voluntary crouches accorded them by three groups of hens was recorded. The cocks performed nine actions, i.e. waltzing, tail-wagging, preening, etc. The most active cock received the greatest number of crouches, and the least active, the least number of crouches. Displacement reactions, tidbitting and cornering, are thought to aid the cock in his courtship.—J. Woodford.
- YAMASHINA, Y., and T. UDAGAWA. 1954. The chromosomes of the California Quail, *Lophortyx californica*. *Misc. Repts. Yamashina's Inst. Ornith. and Zool.*, **4**: 176-178.—In Japanese, with English summary.

## REPORT OF THE BIRD PROTECTION COMMITTEE

This has been a critical year for the conservation movement, and only the fact that the conservation organizations have usually presented a united front against destructive legislation has prevented the enactment of many unwise laws. Never since there was any semblance of a national conservation program have the special interests that are determined to invade and get control of national forests, national parks, wildlife refuges, and wilderness areas been bolder and more persistent.

Much of the difficulty has arisen from the fact that the present administration does not yet have a clearly developed conservation program. In fact, bills that would have seriously impaired the conservation estate which the Departments of Interior or Agriculture are supposed to protect sometimes have been endorsed by the responsible departments. One version of the stockmen's persistent attempts to gain legal rights on national forest land had a special endorsement from the President.

None of this legislation became law owing to the alert and conservation-minded members of both parties in the Congress—particularly in the House. Despite all the activities of the pressure groups, sometimes actively aided by administrative agencies, the Congress held the line. It even amended at the last moment the Atomic Energy Act and the amendments to the Mineral Leasing Act to protect the national parks, monuments, and wildlife refuges.

The united conservation groups were successful in preventing the passage of numerous bad bills but were less successful in pushing good legislation. The Hunter Bill, which will provide water for important waterfowl wintering areas in California, and the Hope-Aiken Watershed Protection and Flood Prevention Act are the most notable positive legislative achievements since the last meeting of the American Ornithologists' Union.

*Rare Birds.*—Of general interest is the possible discovery of the breeding grounds of the few remaining Whooping Cranes. The Canadian Wildlife Service reports that four or possibly six Whooping Cranes were seen in Wood Buffalo Park on June 30; if all reports are correct, this included 5 adults and one young. It is possible that the actual nesting grounds lie within this great unbroken wilderness park, which contains about 17,300 square miles.

Congressional authorization for leasing lands within the breeding range of the Key Deer may prove of little permanent benefit to these animals. Leases can be negotiated, but they all contain a 90-day cancellation clause and until some land can be secured for permanent development and management, there is little hope of any permanent gain in the status of the Key Deer and the various species of birds that nest in the United States only on these keys.

Another possible cause for concern is the fact that the United Water Conservation District of Santa Paula, California, has filed an application for a license for water power projects which may result eventually in impoundments in or near the nesting grounds of the remaining Condors. This poses a potential threat to these birds that should be watched carefully.

On the bright side of the picture certain facts might be mentioned. The steady northward spread of nesting colonies of egrets and other herons following the fine public education and protection work that has been carried out over the years by the National Audubon Society and the Fish and Wildlife Service gives cause for real satisfaction. These birds are more secure and are steadily reoccupying the old known nesting ranges. Likewise, the apparent increase in such shorebirds as the Golden Plover and the Hudsonian Godwit is a cause for satisfaction.

*Waterfowl.*—The waterfowl picture is not so rosy. Despite adverse reports on waterfowl populations for the second successive year in some flyways, some liberalizations in regulations were given. One of the most questionable changes, in the opinion of your Committee, is the permission to extend the shooting season to January 20 by sacrificing two earlier days of the season for every day taken beyond January 10. Fortunately, the penalty was severe enough so that when this report was prepared, Georgia was the only state that had taken advantage of it. There are sound biological reasons why shooting should not continue beyond early January, particularly when waterfowl are on the downgrade.

There has been a steadily increasing trend in the Fish and Wildlife Service to give more voice to the states in the making of regulations. For example, this year the states were permitted to select either a daily shooting hour from one-half hour before sunrise to sunset or one from one-half hour before sunrise to one hour before sunset. There is little question that shooting until sunset increases the wastage of birds whether they are shot dead or crippled. Despite this fact only the states of Alabama, Arkansas, Illinois, Iowa, Mississippi, Missouri, and Tennessee elected to close one hour before sunset; all others took advantage of the maximum allowable shooting hours.

There were some small gains. The season on Wood Ducks was closed in the Mississippi Valley. The limit on the Hooded Merganser was continued at one bird which must be counted as a part of the daily bag limit; and the former provision of allowing 25 Red-breasted and American mergansers to be killed has been altered to require that these birds, if killed, must be counted as part of the daily waterfowl limit.

One of the most disturbing developments occurred in this year's appropriations bill for the Fish and Wildlife Service. For next year a large part of the operation and maintenance of refuges which had previously been carried on regular appropriations are to be carried on the Duck Stamp Fund. Members of A.O.U. may recall that when the price of the duck stamp was doubled some years ago, the increase was supported in the hope that better protection could be afforded migratory birds and that more refuge land could be acquired. This budget, by throwing practically all of the maintenance load onto the Duck Stamp Fund, will almost eliminate land acquisition from future budgets, although some land purchases will be possible this year from funds previously reserved for this purpose.

It has always been necessary to carry some operation and maintenance of refuges on duck stamps because of the refusal of Congress to appropriate sufficient money for this purpose. However, the greater part of the money used has been either for buying or for developing waterfowl land. During the years when the Duck Stamp Fund first became available, much of it went for development since money from various emergency funds was available for land acquisition, but little for land development. When these funds were no longer available, both development and acquisition had to be carried by the Duck Stamp Fund. Conservationists and sportsmen generally supported the increase in the duck stamp with the thought that this increase would provide more land acquisition in the program. There seems to be little hope of this unless the Administration's policy changes and money is allowed for land acquisition in the budget. The Budget Bureau has always attempted to force operation and maintenance costs upon the Duck Stamp Fund, but the Service up to this last year has been fairly successful in fighting off these attempts. To put it bluntly, the refuge program, which is only about half completed, appears to be stalemated for the present. While the Federal Government is slowing down on the

purchase of land for wildlife, a growing number of states are using Pittman-Robertson funds for buying land.

The situation can become critical if present policies are continued for long, since the wildlife refuges have played and will continue to play a key rôle in the wildlife conservation program.

Your Committee, as individuals, has been active in many of the conservation battles and have had generous and unfailing support from many of the members of the A.O.U. whenever they have been asked to help.

Ira N. Gabrielson, *Chairman*  
Ludlow Griscom  
Hoyes Lloyd

#### NOTES AND NEWS

We regret to report the death of Charles F. Batchelder on November 7, 1954. Mr. Batchelder, who was 98 years old, was the last surviving Founder of the A.O.U. and its president from 1905 to 1908. He also served as associate editor of 'The Auk.' The Union suffered the loss also of a Corresponding Fellow, Ludwig Schuster of Hessen, Germany, on September 7, 1954.

It is a pleasure to acknowledge a generous donation from Mr. C. M. Goethe of Sacramento, California. Mr. Goethe made this contribution expressly toward the printing of an unpublished thesis in ornithology, and we have used it to help defray the cost of printing F. W. Loetscher's paper on North American migrants in Veracruz, which appears in this issue and which is part of a doctoral thesis submitted to Cornell University.

Mr. Goethe has expressed the hope that others will join him in providing funds which will enable 'The Auk' to publish the valuable theses on birds which are now unavailable to ornithologists.

At the banquet at the Madison meeting, a number of china and wooden birds, serving as decorations, were taken under the impression that they, as well as the auklets, were favors. Since many of these birds had associations of great value to the owners, the local committee will be grateful for their return. They should be sent to Robert A. McCabe, 424 University Farm Place, Madison, Wisconsin.

The publication date of "Recent Studies in Avian Biology" has been established by the University of Illinois Press as on or about June 15, 1955. The Treasurer wishes to thank subscribers for their patience and requests that further inquiries be withheld.



**FARIDA WILEY** is assistant chairman of the Department of Public Instruction at the American Museum of Natural History. For many years she has conducted natural science field trips sponsored by the Museum, and is an instructor at the Audubon Camp of Maine. Miss Wiley is the author of "Ferns of Northeastern United States," and compiler of "John Burrough's America" and "Ernest Thompson Seton's America."

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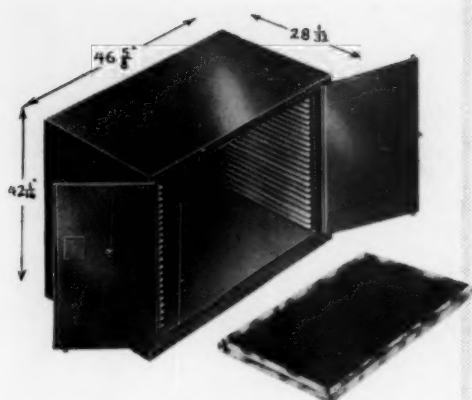
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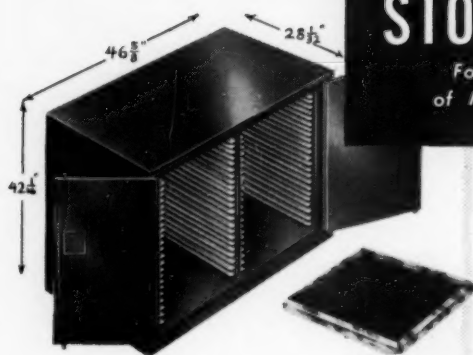




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Proofs of all articles and notes will be sent to authors. Reprints from articles, 'General Notes,' and 'Correspondence' are to be paid for by the author. These must be ordered from the Editor on the blanks sent with the proof and must be returned with the proof. Printed covers can be furnished at additional cost.

All articles and notes submitted for publication and all books and publications intended for review should be sent to the Editor.

ROBERT W. STORER, *Museum of Zoology, University of Michigan, Ann Arbor, Michigan.*

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